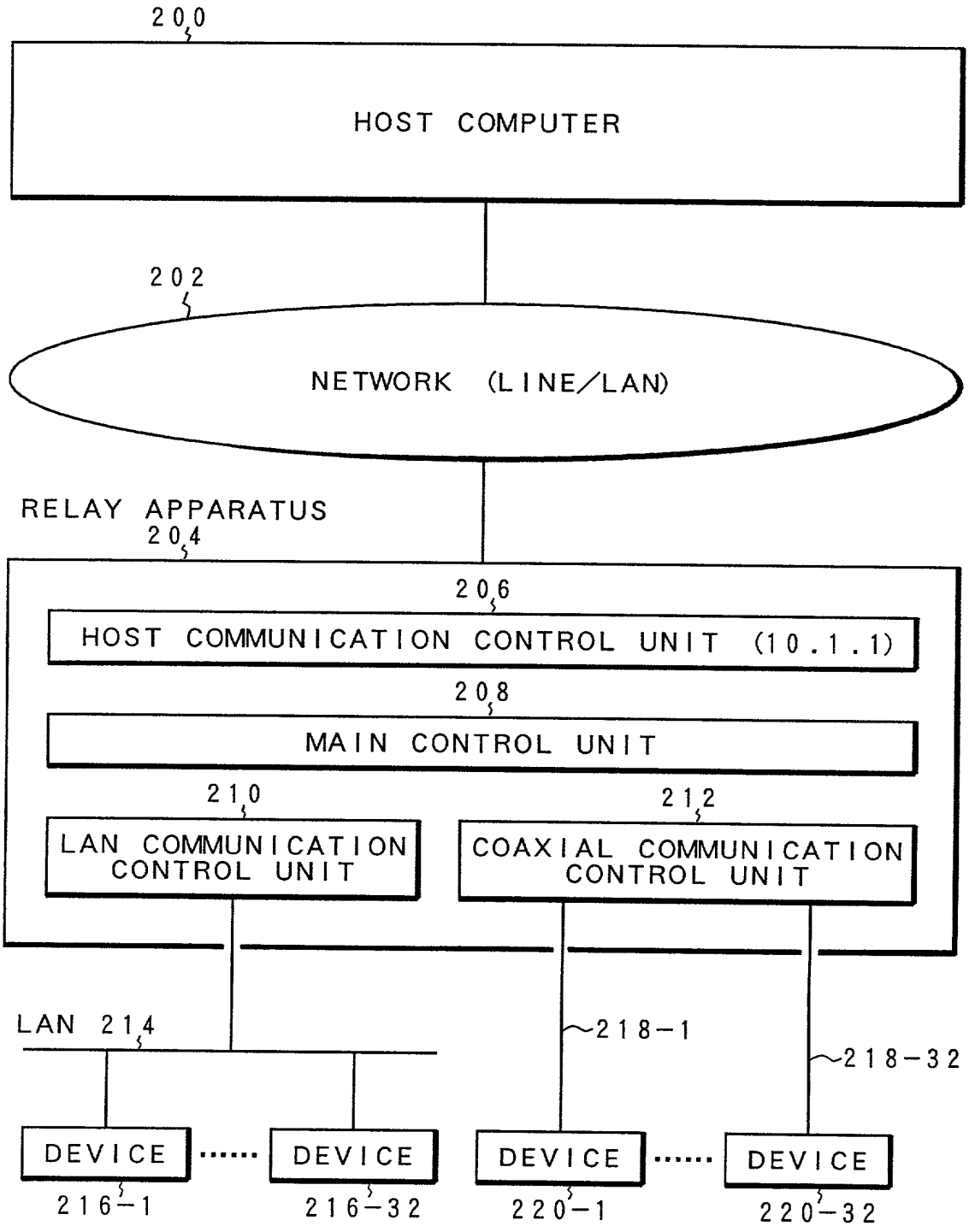
FIG. 1 PRIOR ART



PRIOR ART
FIG. 2A

222

DEVICE NO.	RELAY APPARATUS ADDRESS
0	10.1.1
1	10.1.1
2	10.1.1
⋮	⋮
n	10.1.1

PRIOR ART
FIG. 2B

224

DEVICE NO.	DEVICE ADDRESS
0	10.1.1.0
1	10.1.1.1
2	10.1.1.2
3	10.1.1.3
⋮	⋮
n	10.1.1.n

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FIG. 3A PRIOR ART

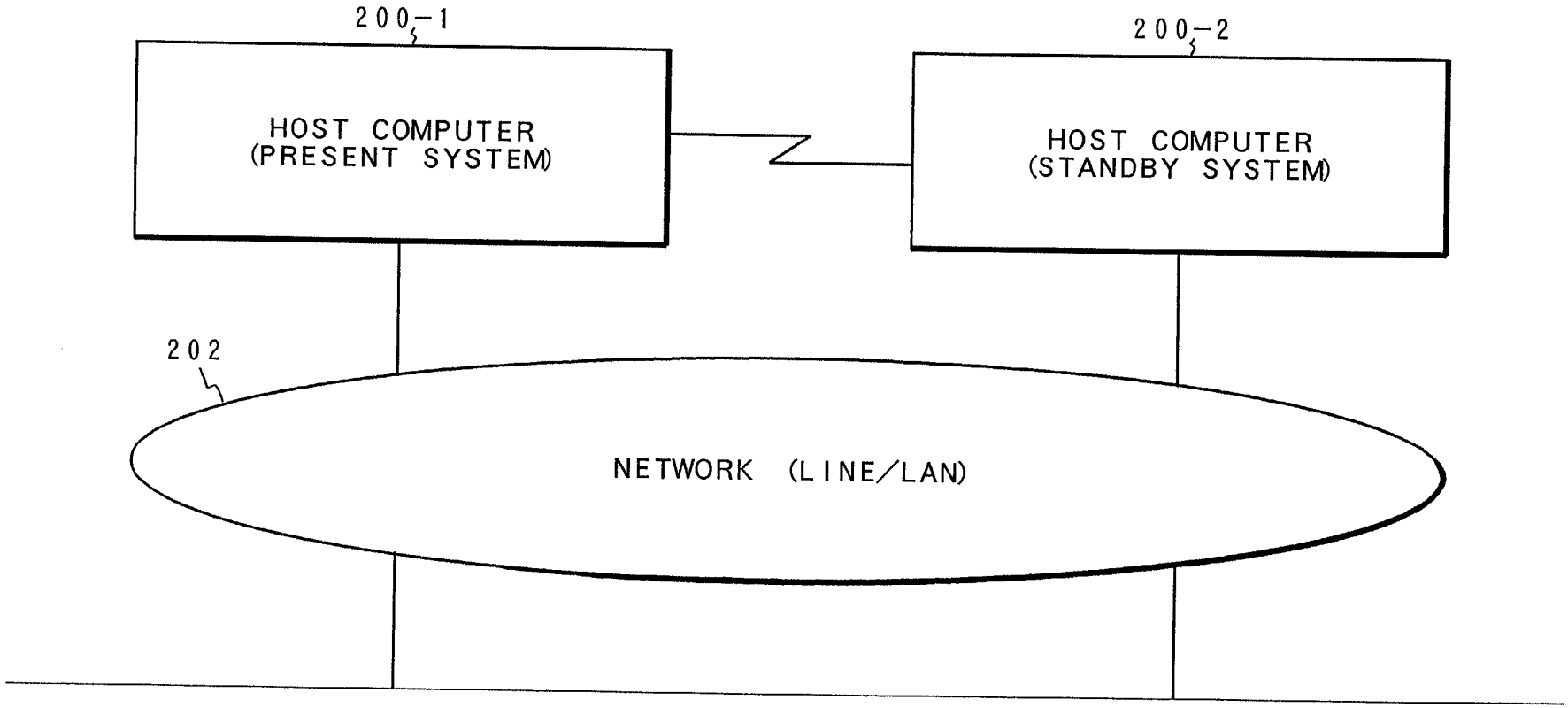

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FIG. 3B PRIOR ART

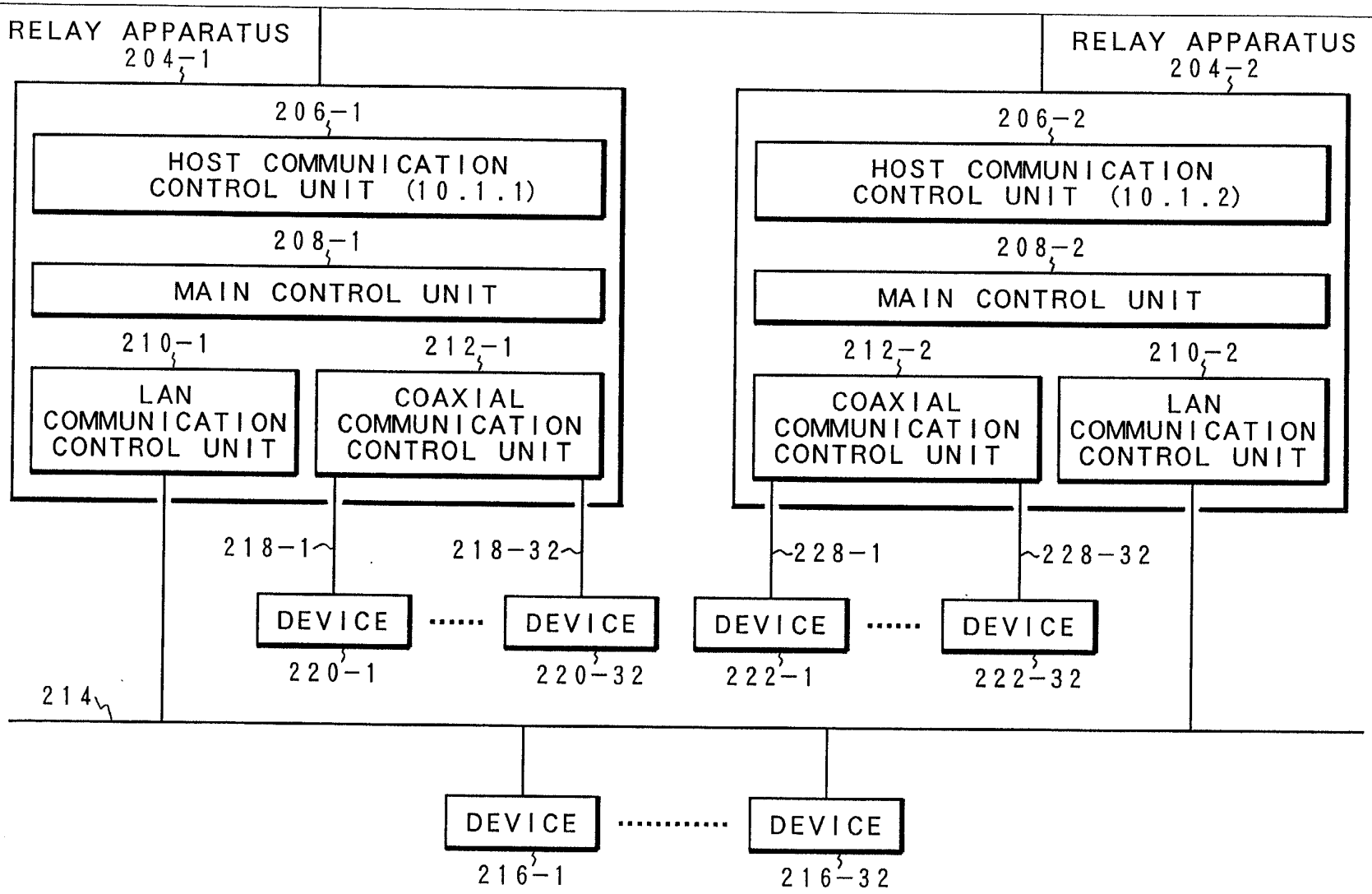

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FIG. 4A PRIOR ART

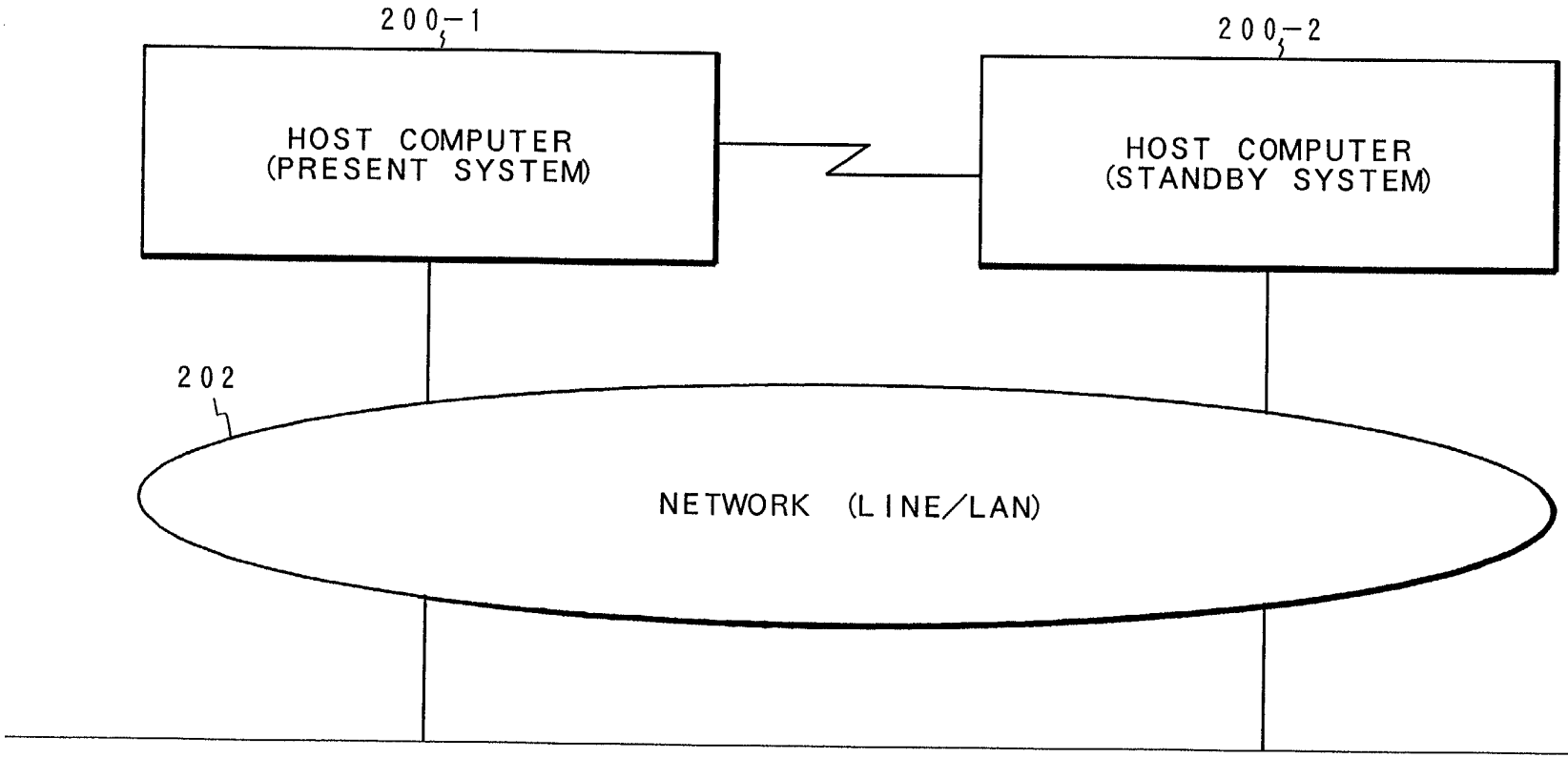

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FIG. 4B PRIOR ART

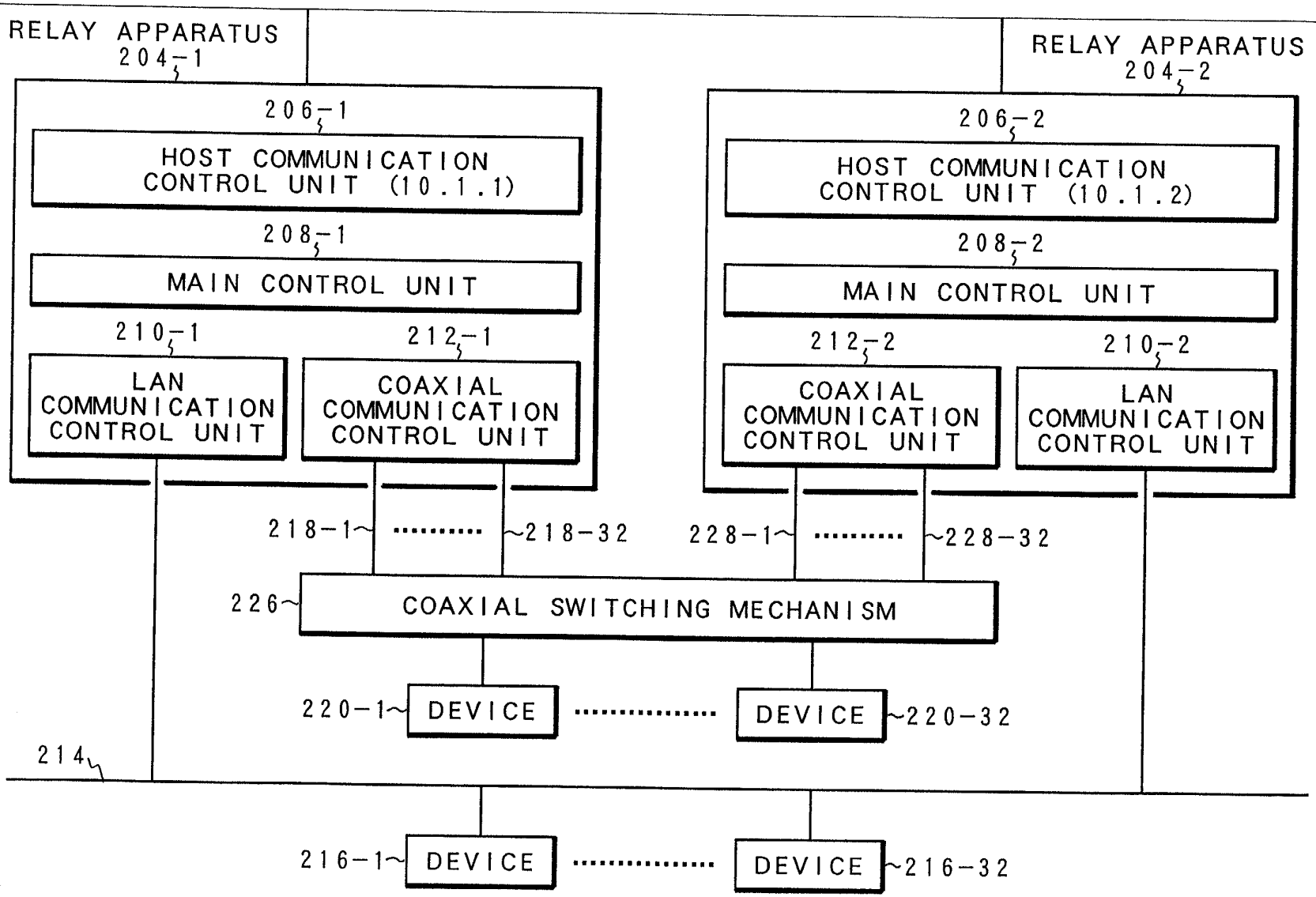

FIG. 5

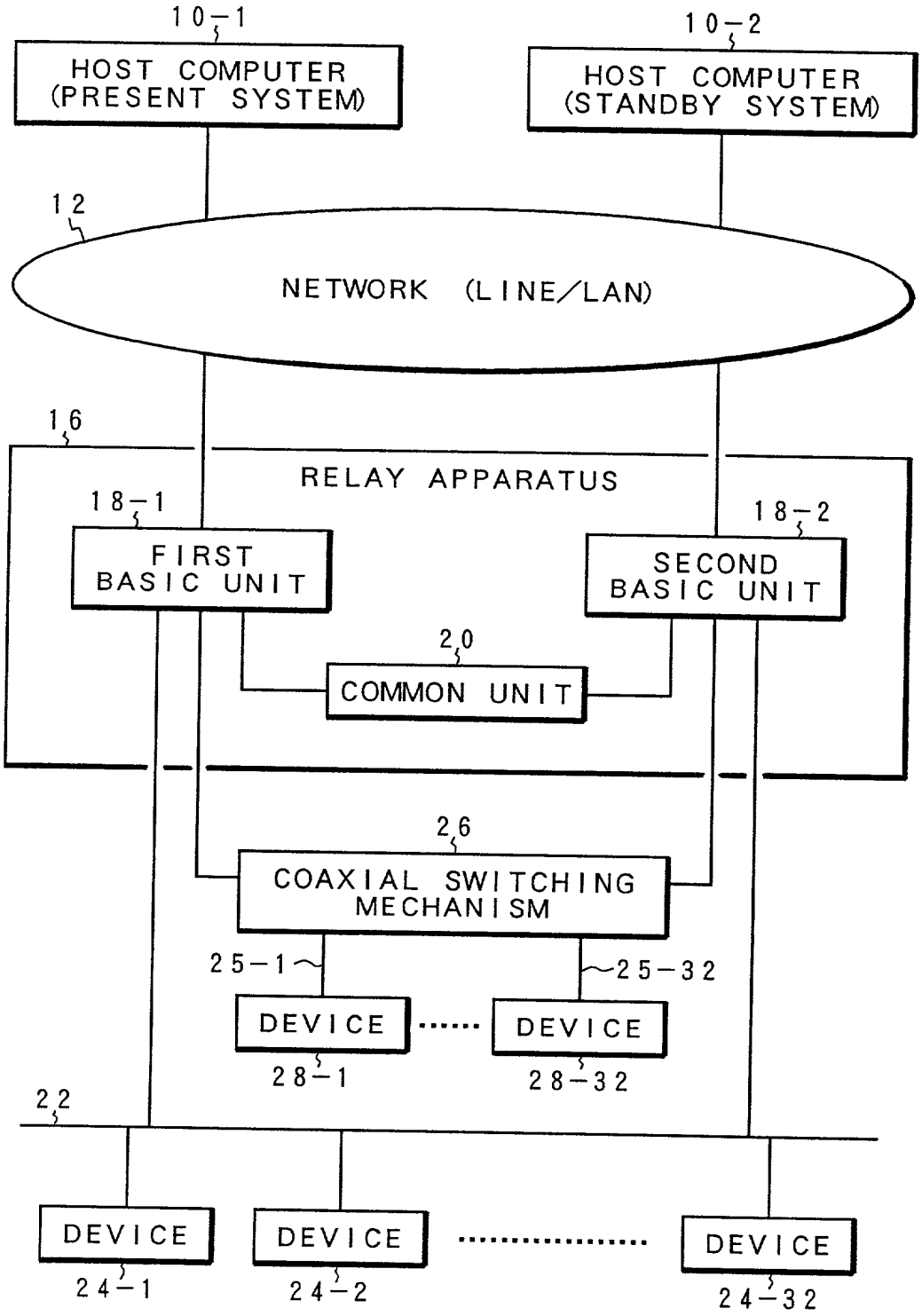
10-1
HOST COMPUTER (PRESENT SYSTEM)
10-2
HOST COMPUTER (STANDBY SYSTEM)
12
NETWORK (LINE/LAN)
16
RELAY APPARATUS
18-1
FIRST BASIC UNIT
18-2
SECOND BASIC UNIT
20
COMMON UNIT
26
COAXIAL SWITCHING MECHANISM
25-1
25-32
DEVICE
28-1
DEVICE
28-32
22
DEVICE
24-1
DEVICE
24-2
DEVICE
24-32

FIG. 6A

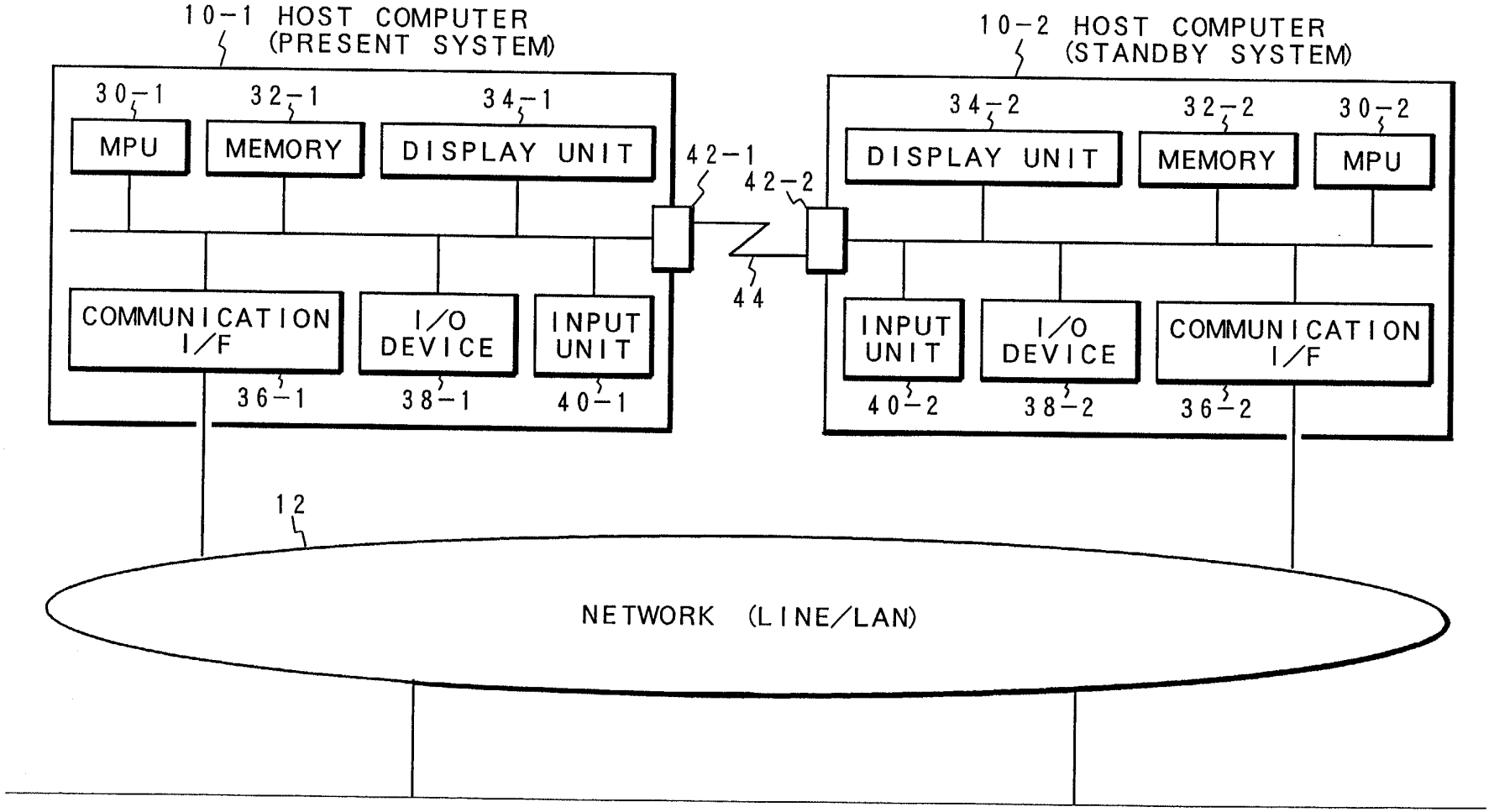
10-1 HOST COMPUTER
(PRESENT SYSTEM)
30-1
MPU
32-1
MEMORY
34-1
DISPLAY UNIT
42-1
42-2
44
COMMUNICATION I/F
36-1
I/O DEVICE
38-1
INPUT UNIT
40-1
10-2 HOST COMPUTER
(STANDBY SYSTEM)
34-2
DISPLAY UNIT
32-2
MEMORY
30-2
MPU
INPUT UNIT
40-2
I/O DEVICE
38-2
COMMUNICATION I/F
36-2
12
NETWORK (LINE/LAN)

FIG. 6B

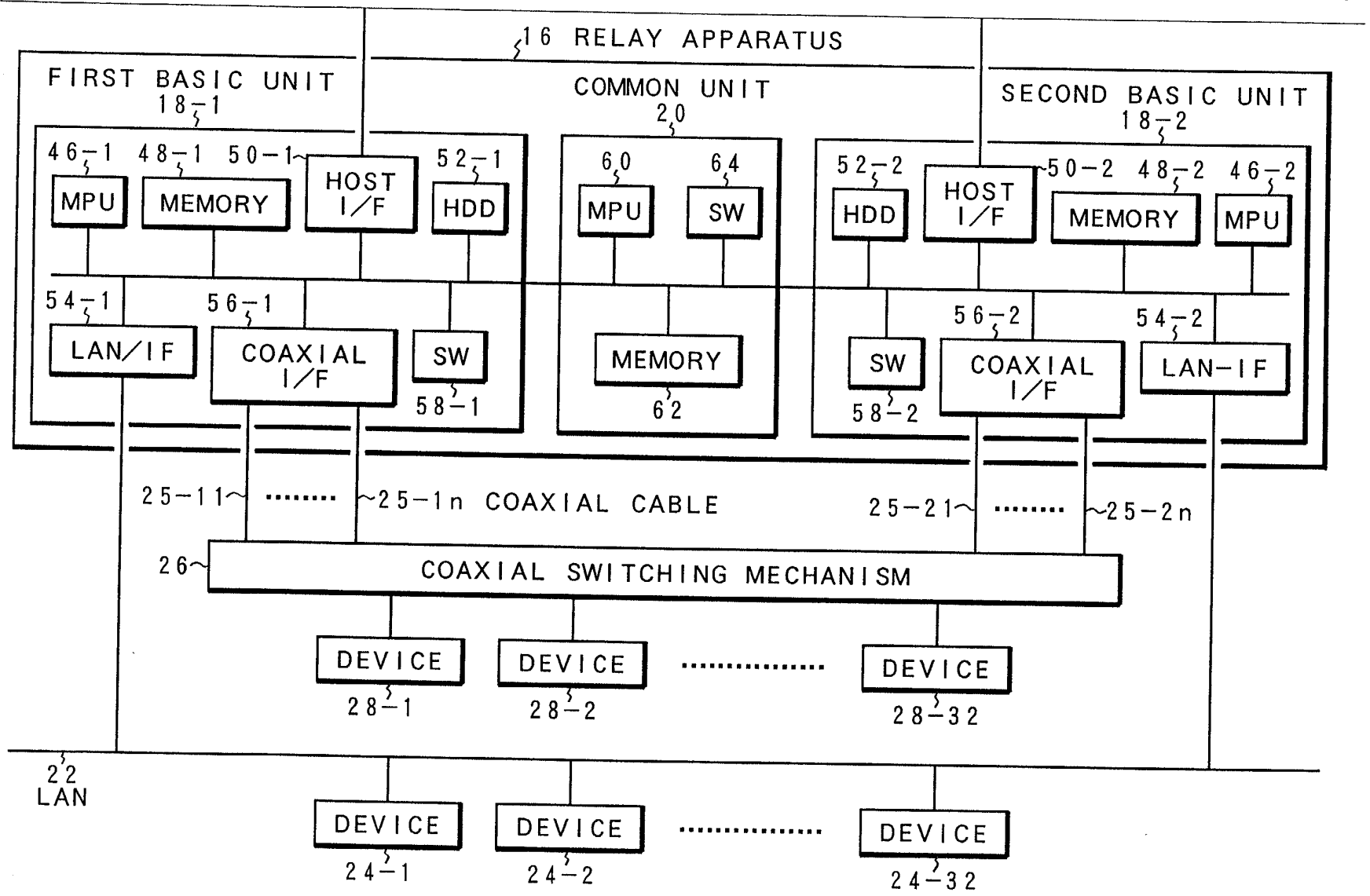
16 RELAY APPARATUS
FIRST BASIC UNIT
18-1
COMMON UNIT
20
SECOND BASIC UNIT
18-2
46-1
48-1
50-1
52-1
60
64
52-2
50-2
48-2
46-2
MPU
MEMORY
HOST I/F
HDD
MPU
SW
HDD
HOST I/F
MEMORY
MPU
54-1
56-1
56-2
54-2
LAN/IF
COAXIAL I/F
SW
58-1
MEMORY
62
SW
58-2
COAXIAL I/F
LAN-IF
25-11
25-1n COAXIAL CABLE
25-21
25-2n
26
COAXIAL SWITCHING MECHANISM
DEVICE
28-1
DEVICE
28-2
DEVICE
28-32
22
LAN
DEVICE
24-1
DEVICE
24-2
DEVICE
24-32

FIG. 7A

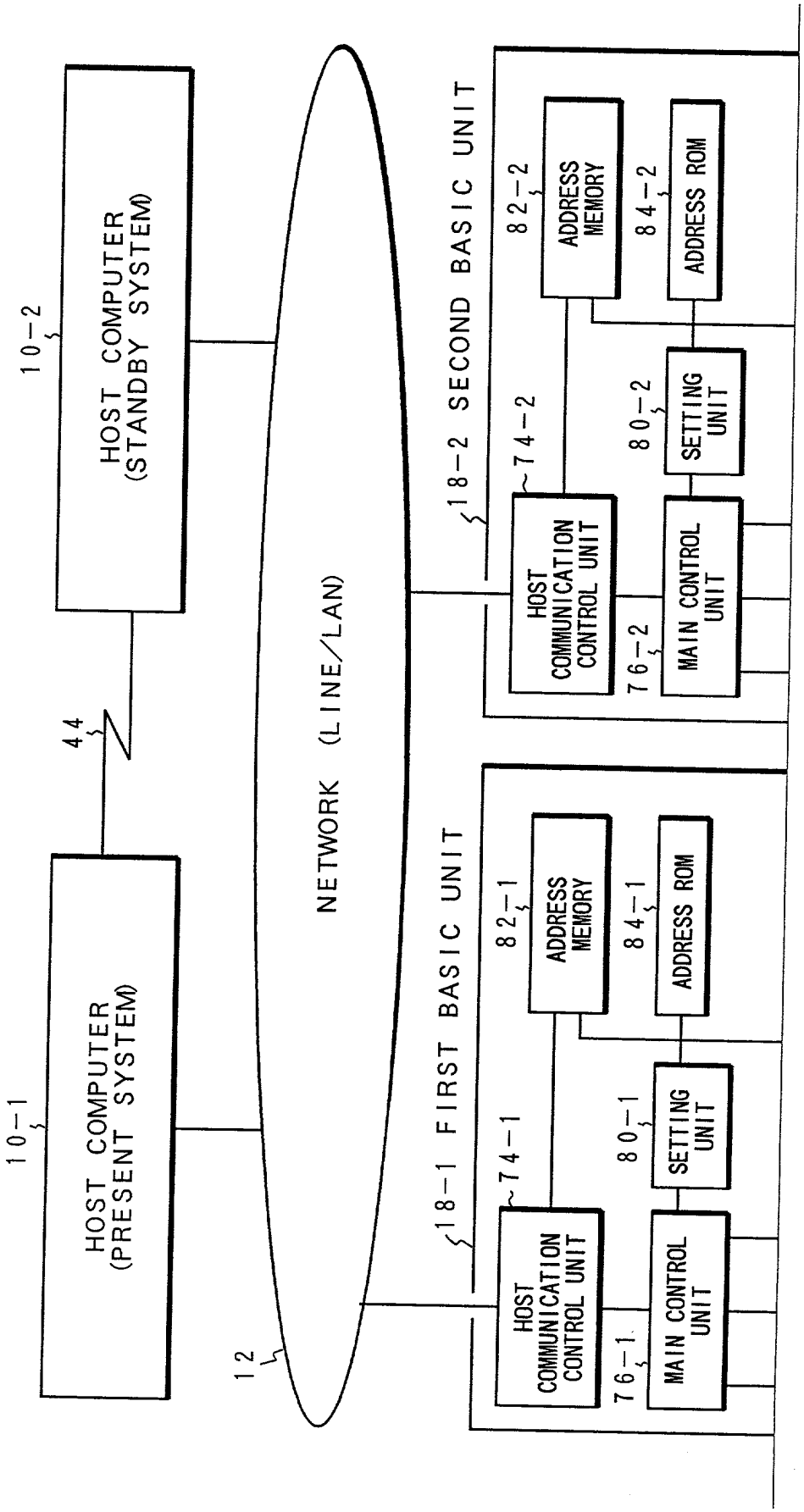
HOST COMPUTER (PRESENT SYSTEM)
10-1
HOST COMPUTER (STANDBY SYSTEM)
10-2
44
NETWORK (LINE/LAN)
12
18-1 FIRST BASIC UNIT
18-2 SECOND BASIC UNIT
HOST COMMUNICATION CONTROL UNIT
74-1
74-2
MAIN CONTROL UNIT
76-1
76-2
SETTING UNIT
80-1
80-2
ADDRESS MEMORY
82-1
82-2
ADDRESS ROM
84-1
84-2

FIG. 7B

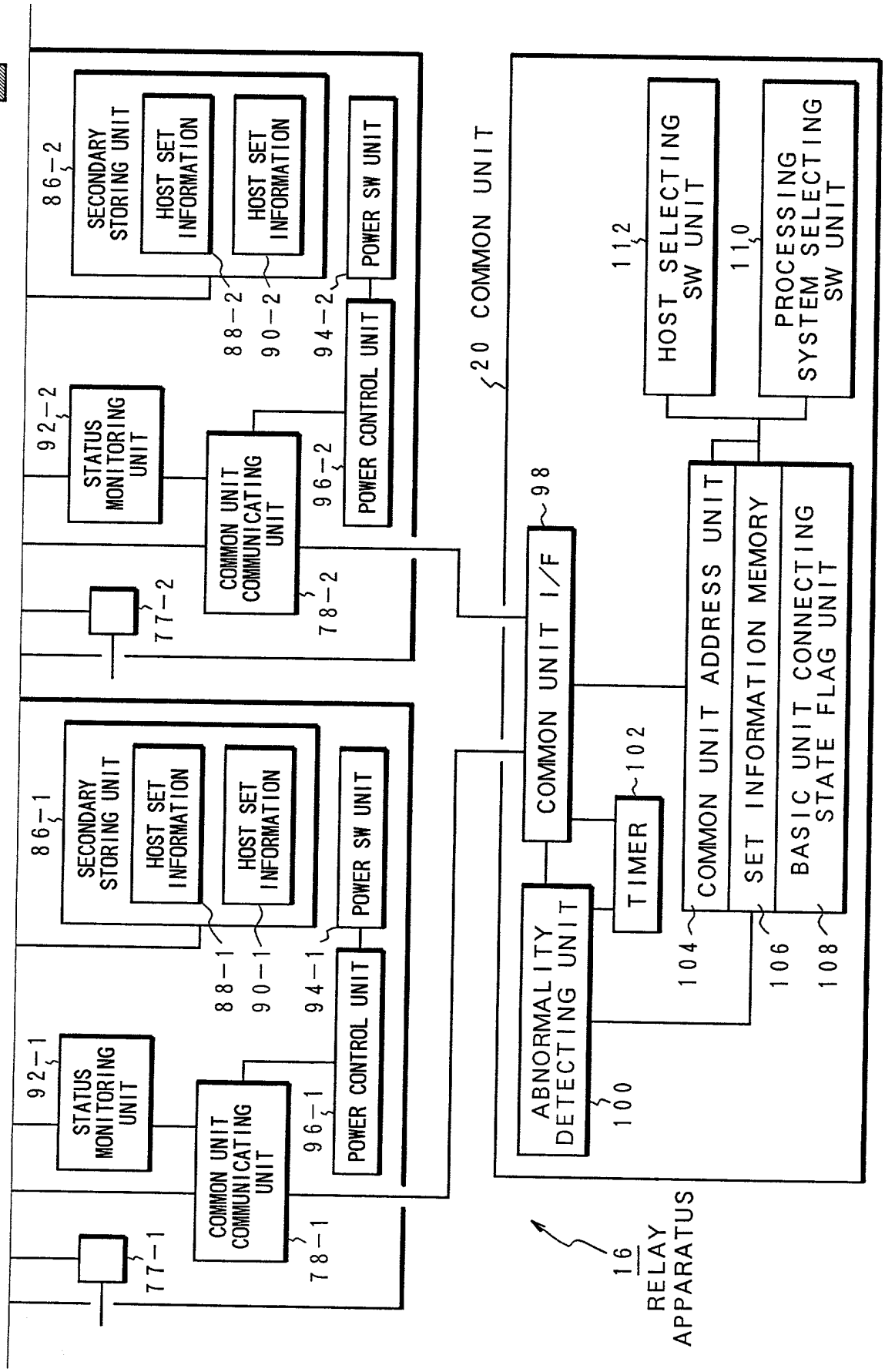
16
RELAY APPARATUS
20 COMMON UNIT
77-1
77-2
78-1
78-2
86-1
86-2
88-1
88-2
90-1
90-2
92-1
92-2
94-1
94-2
96-1
96-2
98
100
102
104
106
108
110
112
SECONDARY STORING UNIT
HOST SET INFORMATION
POWER SW UNIT
STATUS MONITORING UNIT
COMMON UNIT COMMUNICATING UNIT
POWER CONTROL UNIT
COMMON UNIT I/F
ABNORMALITY DETECTING UNIT
TIMER
COMMON UNIT ADDRESS UNIT
SET INFORMATION MEMORY
BASIC UNIT CONNECTING STATE FLAG UNIT
HOST SELECTING SW UNIT
PROCESSING SYSTEM SELECTING SW UNIT

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FIG. 8

ITEM	CONTENTS	DESCRIPTION
CONNECTING HOST PROTOCOL	1:CONNECTION BY LAN ADDRESS 2:CONNECTION BY IP ADDRESS	CONNECTING PROTOCOL BETWEEN HOST AND INTERMEDIATE APPARATUS
CONNECTING HOST ADDRESS	LAN ADDRESS OR IP ADDRESS	ADDRESS FOR IDENTIFYING HOST TO BE CONNECTED
SELF NODE ADDRESS (HOST SIDE)	LAN ADDRESS OR IP ADDRESS	SELF ADDRESS UPON CONNECTION TO HOST SIDE
SUBNET ADDRESS	IP ADDRESS	SUBNET ADDRESS UPON CONNECTION BY IP ADDRESS (UNNECESSARY IN CASE OF LAN ADDRESS)
ROUTER ADDRESS	IP ADDRESS	ROUTER IP ADDRESS UPON CONNECTION BY IP ADDRESS (UNNECESSARY IN CASE OF LAN ADDRESS)
LIST OF CONNECTED DEVICES (INFORMATION OF DEVICES TO BE CONNECTED TO RELAY APPARATUS)	TERMINAL NOs. 0~32	PORT NO.
	DISPLAY/PRINTER	DEVICE TYPE
	LAN ADDRESS OR IP ADDRESS	CONNECTING METHOD
	LAN ADDRESS OR IP ADDRESS	ADDRESS

FIG. 9A

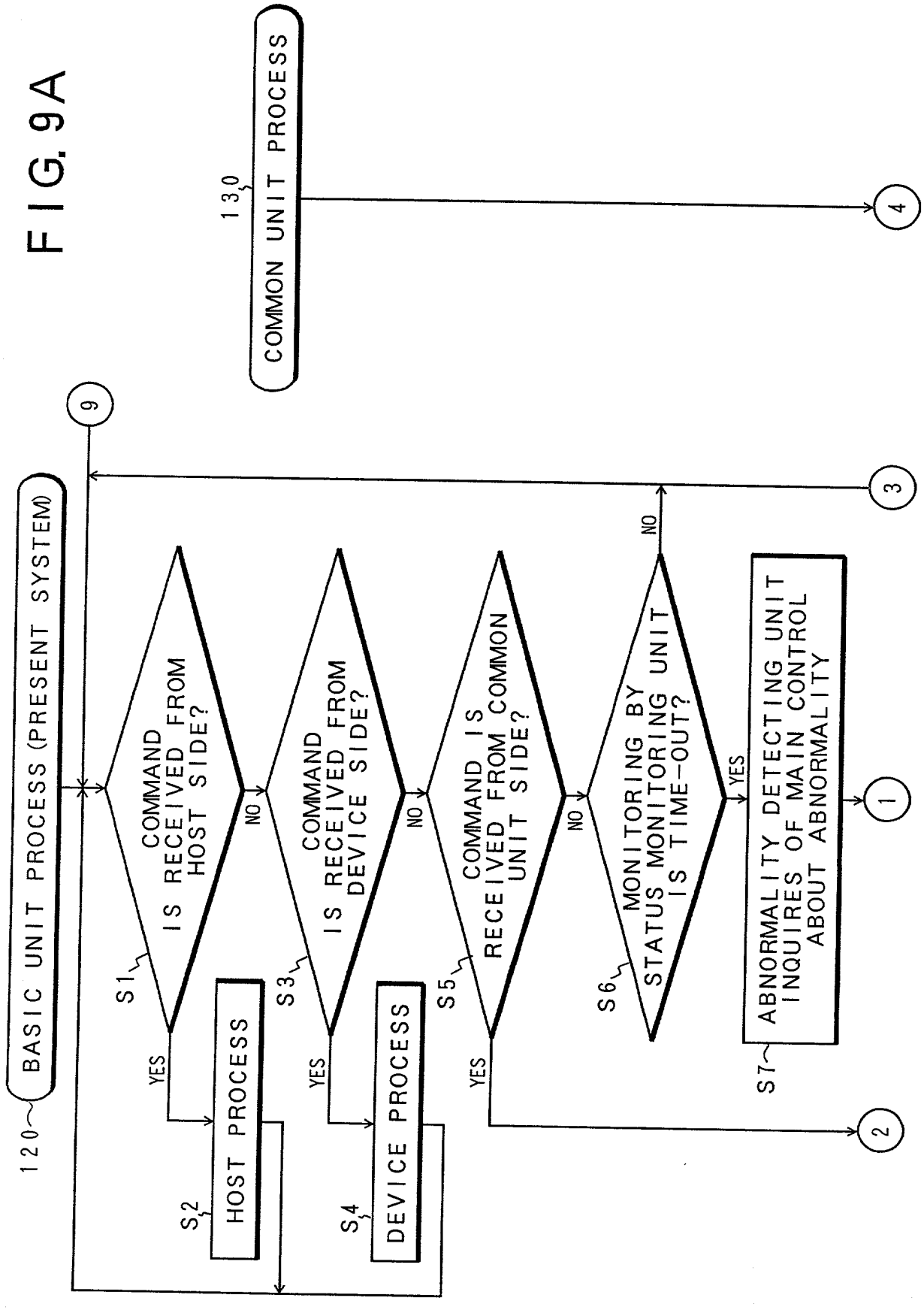
120
BASIC UNIT PROCESS (PRESENT SYSTEM)
9
S1
COMMAND IS RECEIVED FROM HOST SIDE?
YES
S2
HOST PROCESS
NO
S3
COMMAND IS RECEIVED FROM DEVICE SIDE?
YES
S4
DEVICE PROCESS
NO
S5
COMMAND IS RECEIVED FROM COMMON UNIT SIDE?
YES
2
NO
S6
MONITORING BY STATUS MONITORING UNIT IS TIME-OUT?
YES
S7
ABNORMALITY DETECTING UNIT INQUIRES OF MAIN CONTROL ABOUT ABNORMALITY
1
NO
3
130
COMMON UNIT PROCESS
4

FIG. 9B

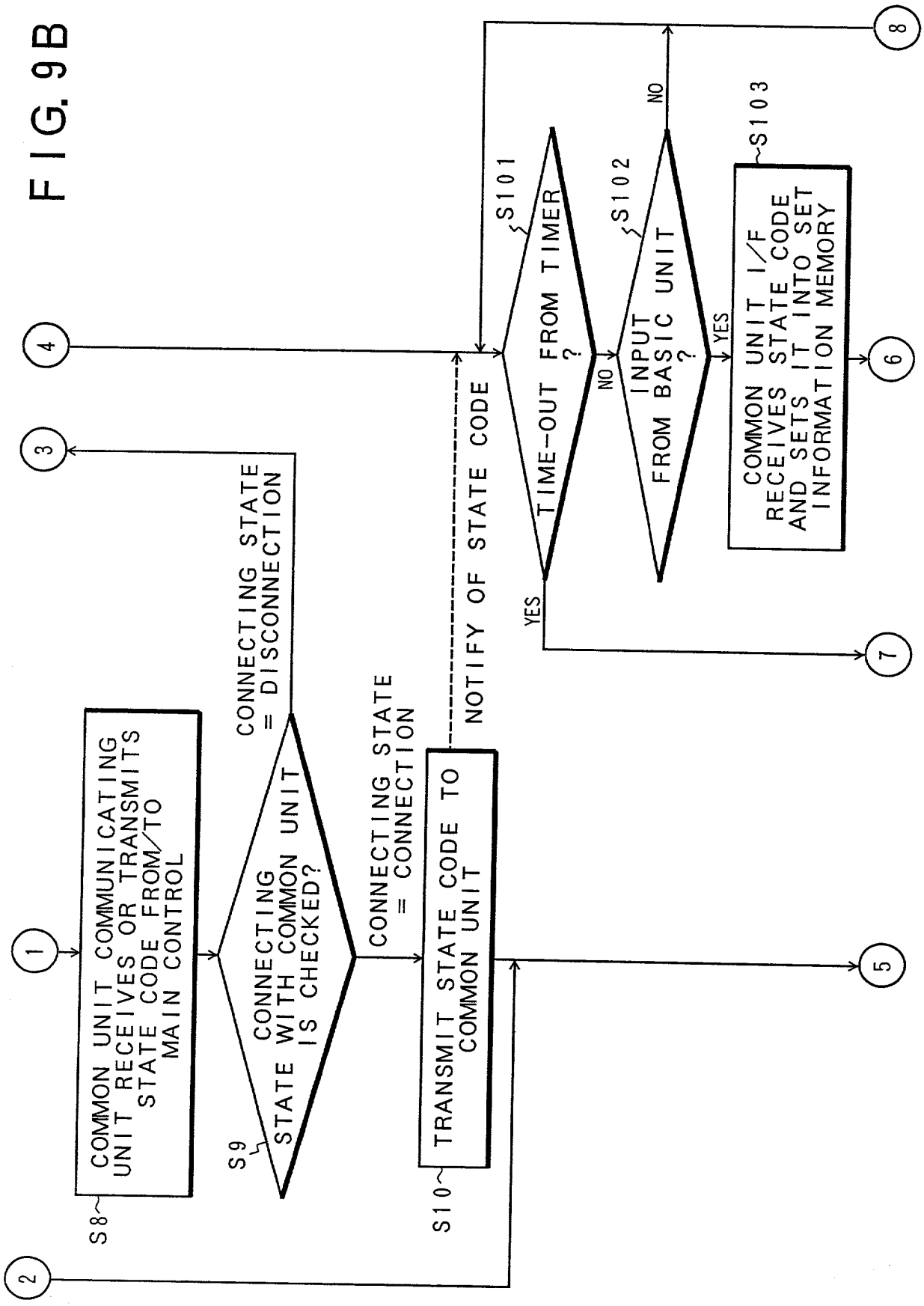
1
COMMON UNIT COMMUNICATING UNIT RECEIVES OR TRANSMITS STATE CODE FROM/TO MAIN CONTROL
S8
CONNECTING STATE WITH COMMON UNIT IS CHECKED?
S9
CONNECTING STATE = DISCONNECTION
CONNECTING STATE = CONNECTION
TRANSMIT STATE CODE TO COMMON UNIT
S10
NOTIFY OF STATE CODE
2
3
4
5
6
7
8
TIME-OUT FROM TIMER ?
S101
YES
NO
INPUT FROM BASIC UNIT ?
S102
YES
NO
COMMON UNIT I/F RECEIVES STATE CODE AND SETS IT INTO SET INFORMATION MEMORY
S103

FIG. 9C

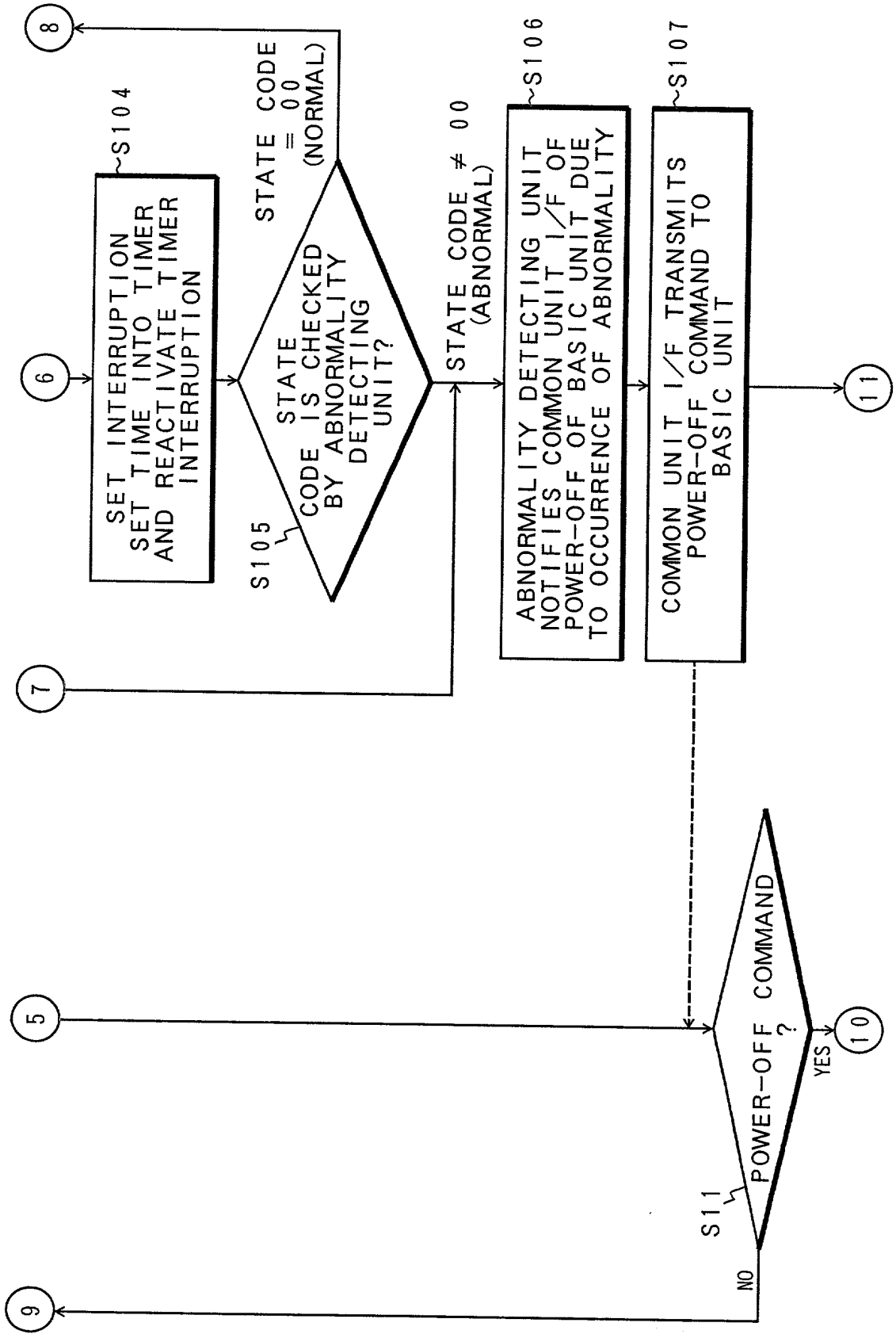
6
S104
SET INTERRUPTION
SET TIME INTO TIMER
AND REACTIVATE TIMER
INTERRUPTION
S105
STATE
CODE IS CHECKED
BY ABNORMALITY
DETECTING
UNIT?
STATE CODE
= 00
(NORMAL)
8
STATE CODE ≠ 00
(ABNORMAL)
7
S106
ABNORMALITY DETECTING UNIT
NOTIFIES COMMON UNIT I/F OF
POWER-OFF OF BASIC UNIT DUE
TO OCCURRENCE OF ABNORMALITY
S107
COMMON UNIT I/F TRANSMITS
POWER-OFF COMMAND TO
BASIC UNIT
11
5
S11
POWER-OFF COMMAND
?
YES
10
NO
9

FIG. 9D

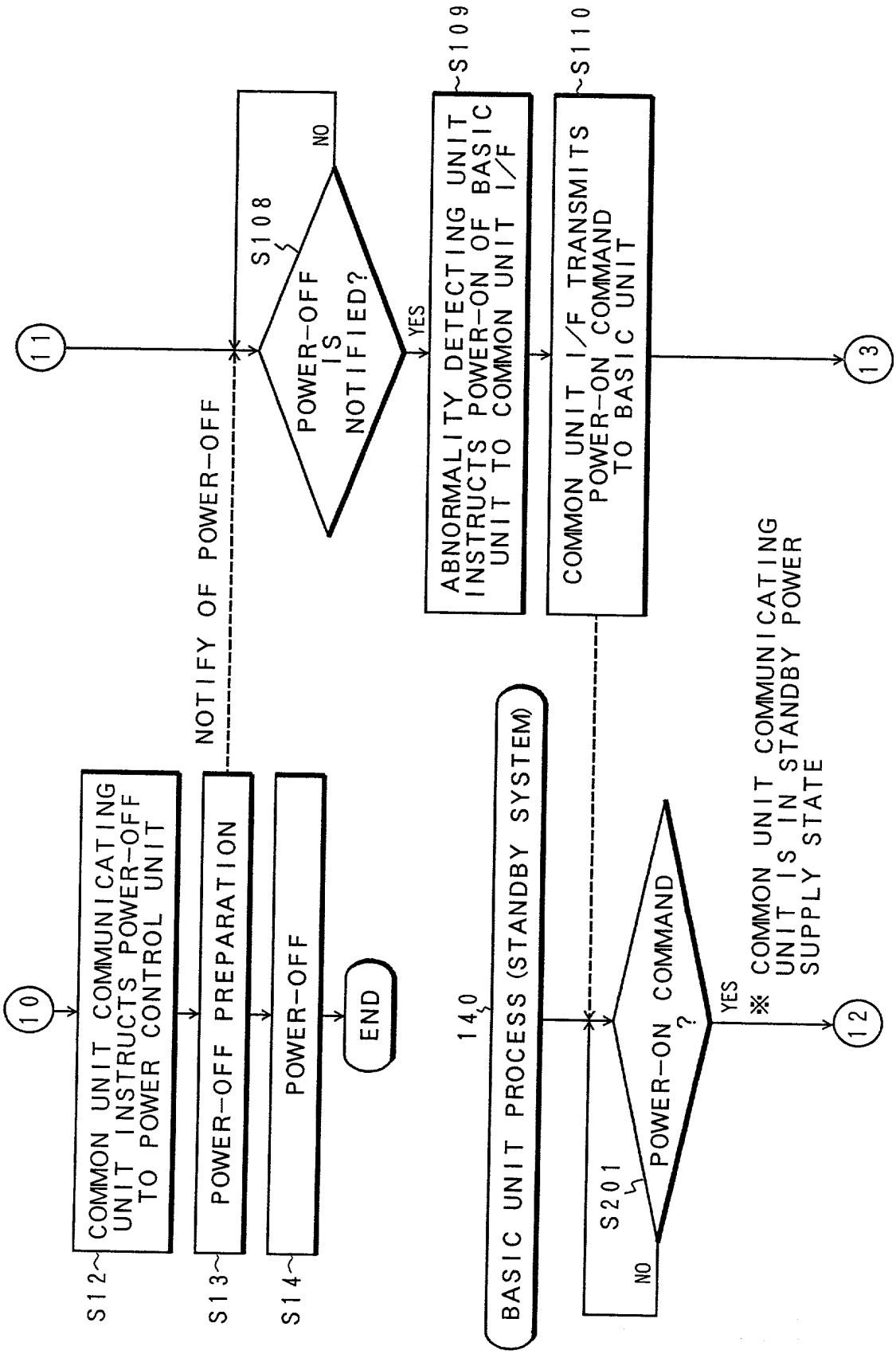
10
S12
COMMON UNIT COMMUNICATING UNIT INSTRUCTS POWER-OFF TO POWER CONTROL UNIT
S13
POWER-OFF PREPARATION
S14
POWER-OFF
END
NOTIFY OF POWER-OFF
11
S108
POWER-OFF IS NOTIFIED?
NO
YES
S109
ABNORMALITY DETECTING UNIT INSTRUCTS POWER-ON OF BASIC UNIT TO COMMON UNIT I/F
S110
COMMON UNIT I/F TRANSMITS POWER-ON COMMAND TO BASIC UNIT
13
140
BASIC UNIT PROCESS (STANDBY SYSTEM)
S201
POWER-ON COMMAND ?
NO
YES
※ COMMON UNIT COMMUNICATING UNIT IS IN STANDBY POWER SUPPLY STATE
12

FIG. 9E

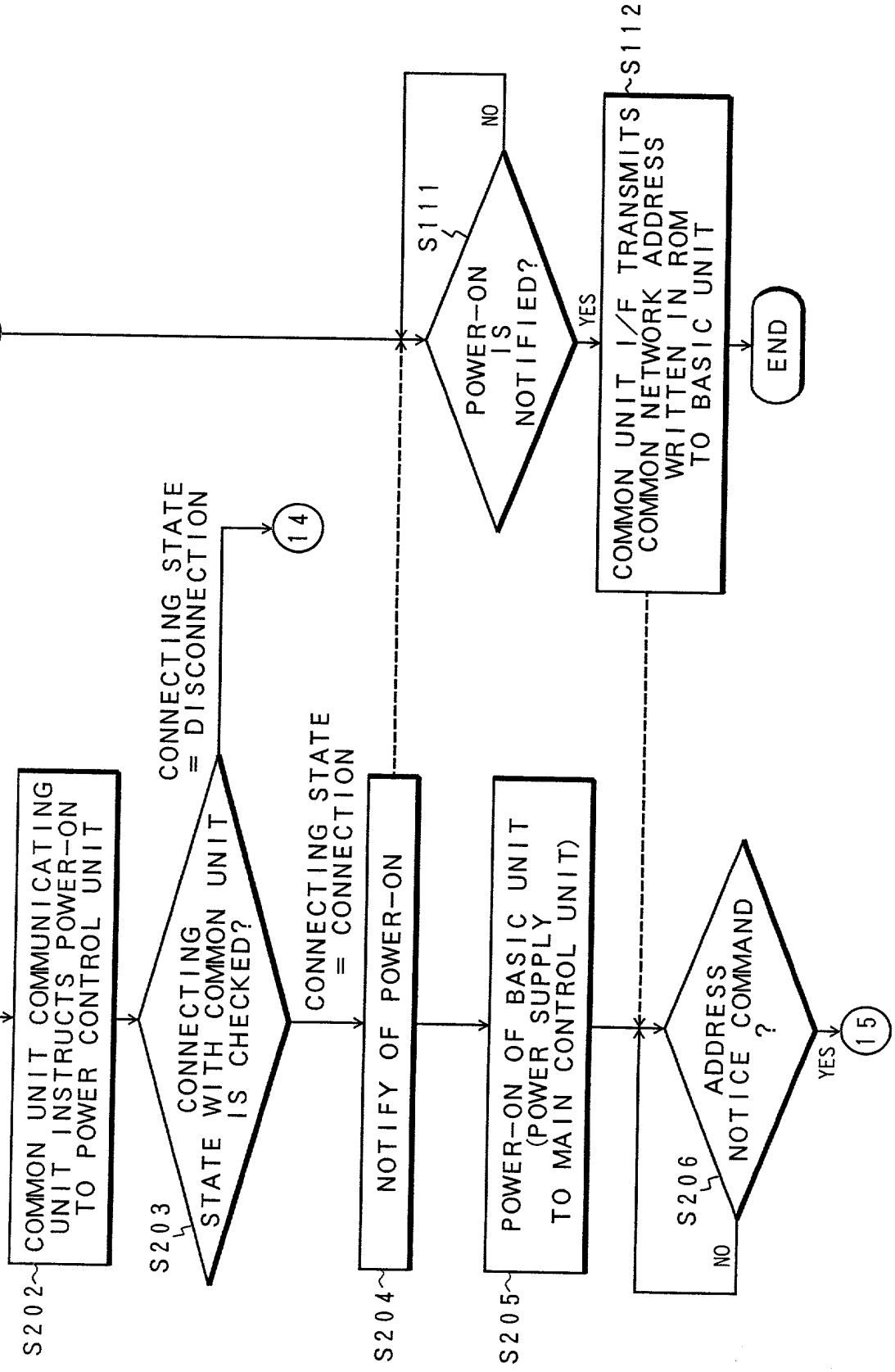
12
S202
COMMON UNIT COMMUNICATING UNIT INSTRUCTS POWER-ON TO POWER CONTROL UNIT
S203
CONNECTING STATE WITH COMMON UNIT IS CHECKED?
CONNECTING STATE = DISCONNECTION
14
CONNECTING STATE = CONNECTION
S204
NOTIFY OF POWER-ON
S205
POWER-ON OF BASIC UNIT (POWER SUPPLY TO MAIN CONTROL UNIT)
S206
ADDRESS NOTICE COMMAND ?
NO
YES
15
13
S111
POWER-ON IS NOTIFIED?
NO
YES
S112
COMMON UNIT I/F TRANSMITS COMMON NETWORK ADDRESS WRITTEN IN ROM TO BASIC UNIT
END

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FIG. 9F

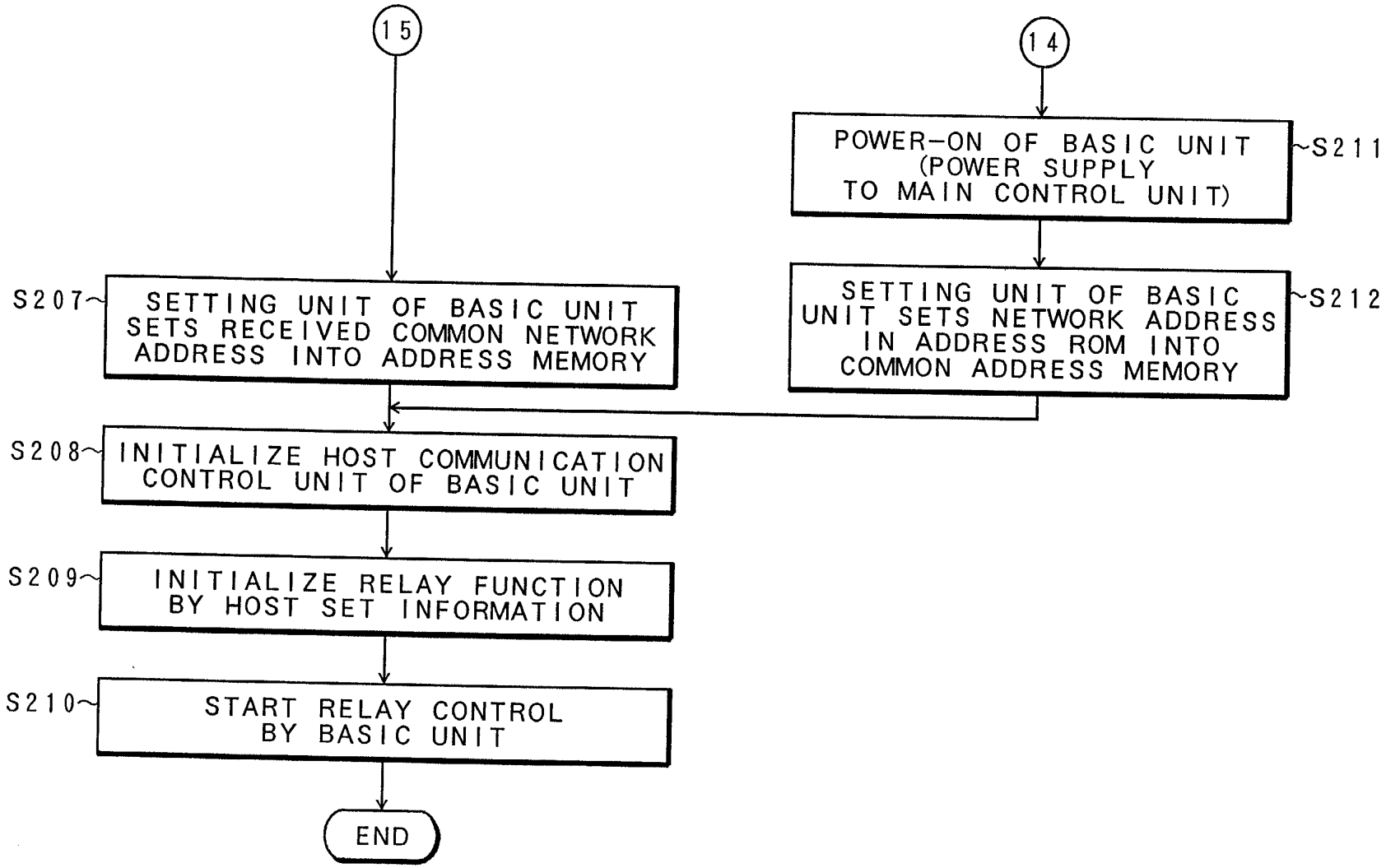

FIG. 10A

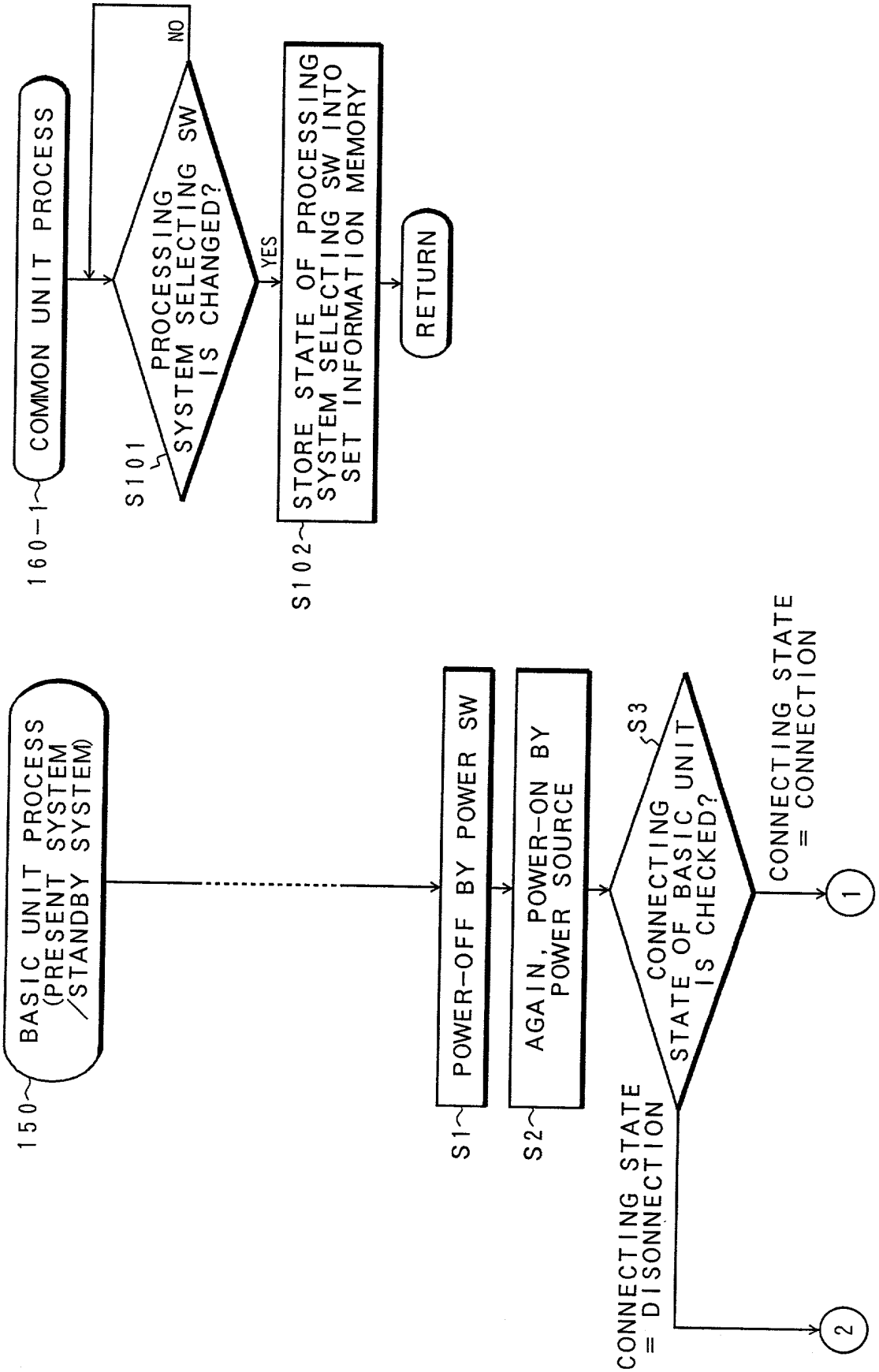
BASIC UNIT PROCESS (PRESENT SYSTEM /STANDBY SYSTEM)
150
POWER-OFF BY POWER SW
S1
AGAIN, POWER-ON BY POWER SOURCE
S2
CONNECTING STATE OF BASIC UNIT IS CHECKED?
S3
CONNECTING STATE = DISCONNECTION
CONNECTING STATE = CONNECTION
2
1
COMMON UNIT PROCESS
160-1
PROCESSING SYSTEM SELECTING SW IS CHANGED?
S101
NO
YES
STORE STATE OF PROCESSING SYSTEM SELECTING SW INTO SET INFORMATION MEMORY
S102
RETURN

FIG.10B

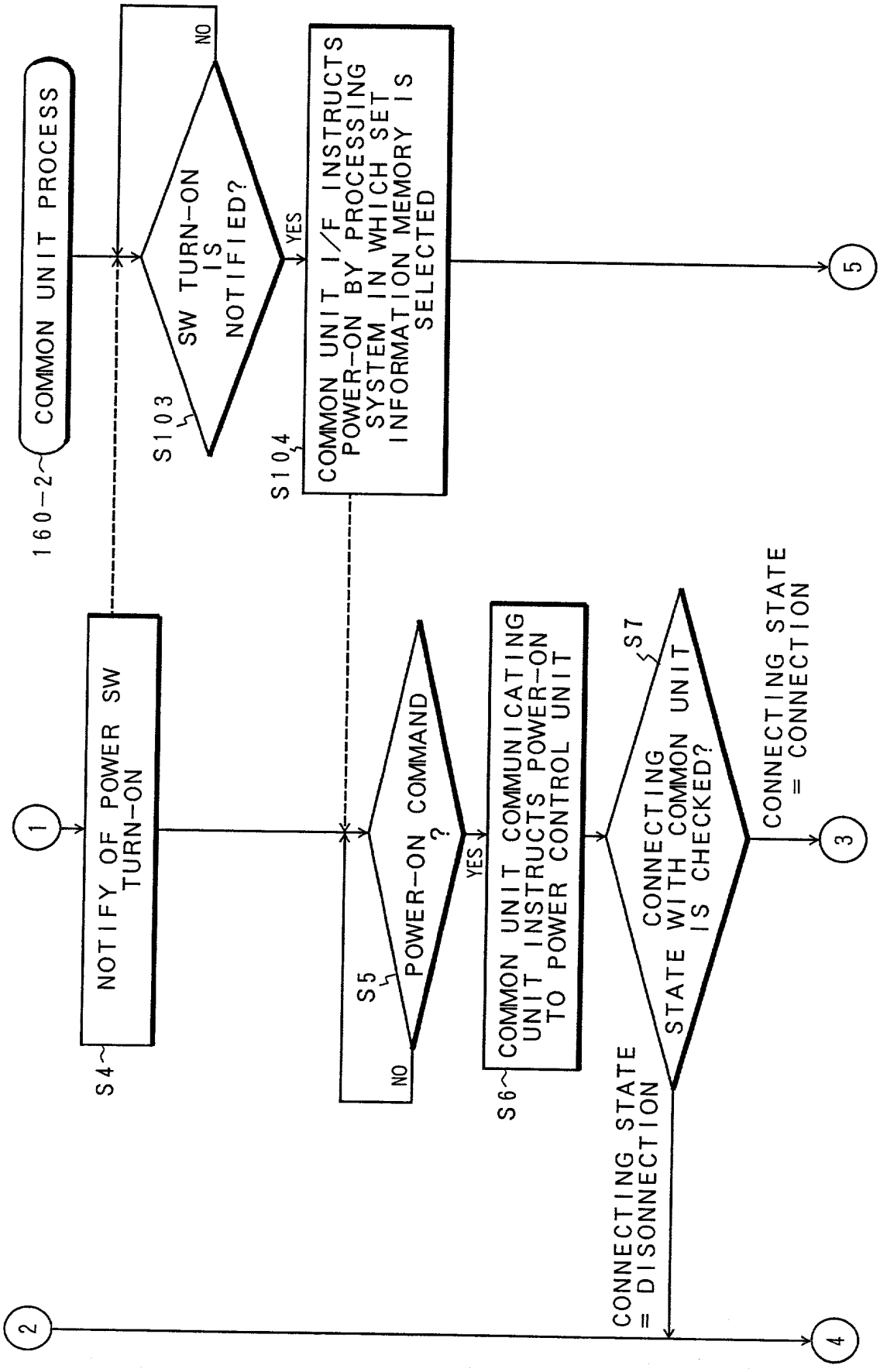
COMMON UNIT PROCESS
160-2
S103
SW TURN-ON IS NOTIFIED?
NO
YES
S104
COMMON UNIT I/F INSTRUCTS POWER-ON BY PROCESSING SYSTEM IN WHICH SET INFORMATION MEMORY IS SELECTED
5
1
NOTIFY OF POWER SW TURN-ON
S4
S5
POWER-ON COMMAND ?
NO
YES
COMMON UNIT COMMUNICATING UNIT INSTRUCTS POWER-ON TO POWER CONTROL UNIT
S6
S7
CONNECTING STATE WITH COMMON UNIT IS CHECKED?
CONNECTING STATE = CONNECTION
3
CONNECTING STATE = DISCONNECTION
2
4

FIG.10C

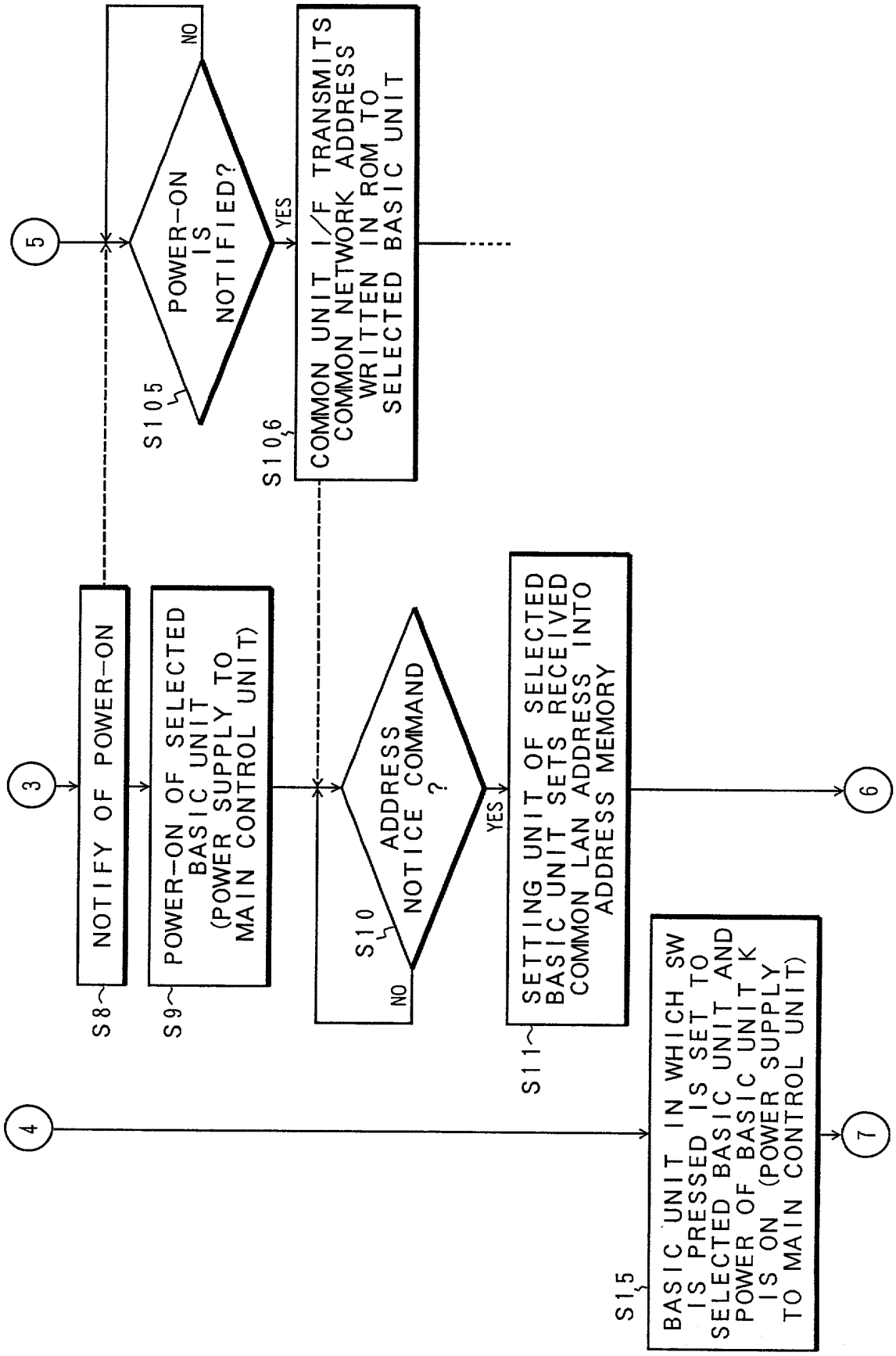
3
NOTIFY OF POWER-ON
S8
POWER-ON OF SELECTED BASIC UNIT (POWER SUPPLY TO MAIN CONTROL UNIT)
S9
5
POWER-ON IS NOTIFIED?
S105
NO
YES
COMMON UNIT I/F TRANSMITS COMMON NETWORK ADDRESS WRITTEN IN ROM TO SELECTED BASIC UNIT
S106
ADDRESS NOTICE COMMAND ?
S10
NO
YES
SETTING UNIT OF SELECTED BASIC UNIT SETS RECEIVED COMMON LAN ADDRESS INTO ADDRESS MEMORY
S11
6
4
BASIC UNIT IN WHICH SW IS PRESSED IS SET TO SELECTED BASIC UNIT AND POWER OF BASIC UNIT K IS ON (POWER SUPPLY TO MAIN CONTROL UNIT)
S15
7

FIG. 10D

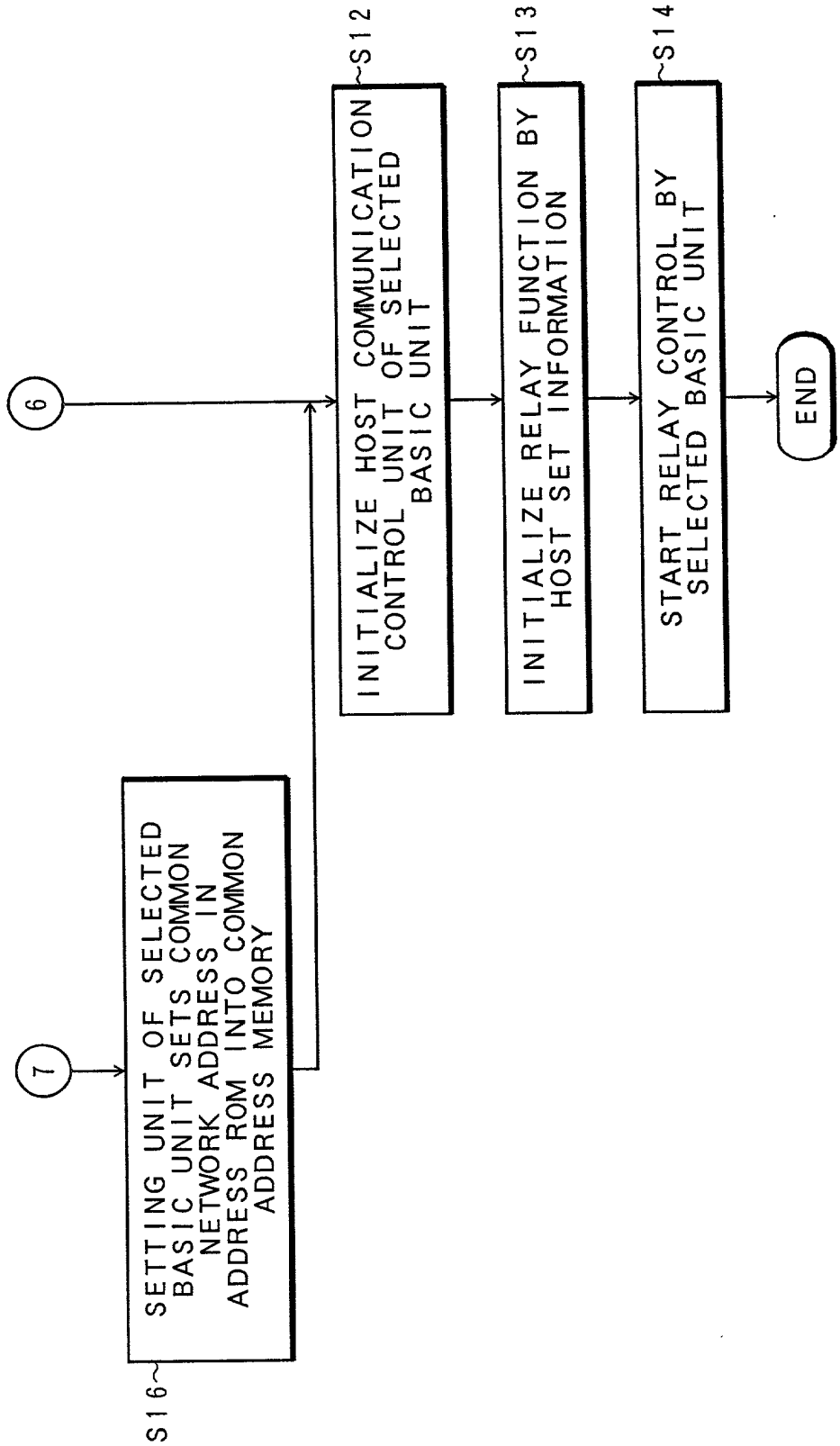
6
7
S16
SETTING UNIT OF SELECTED BASIC UNIT SETS COMMON NETWORK ADDRESS IN ADDRESS ROM INTO COMMON ADDRESS MEMORY
INITIALIZE HOST COMMUNICATION CONTROL UNIT OF SELECTED BASIC UNIT
S12
INITIALIZE RELAY FUNCTION BY HOST SET INFORMATION
S13
START RELAY CONTROL BY SELECTED BASIC UNIT
S14
END

FIG. 11A

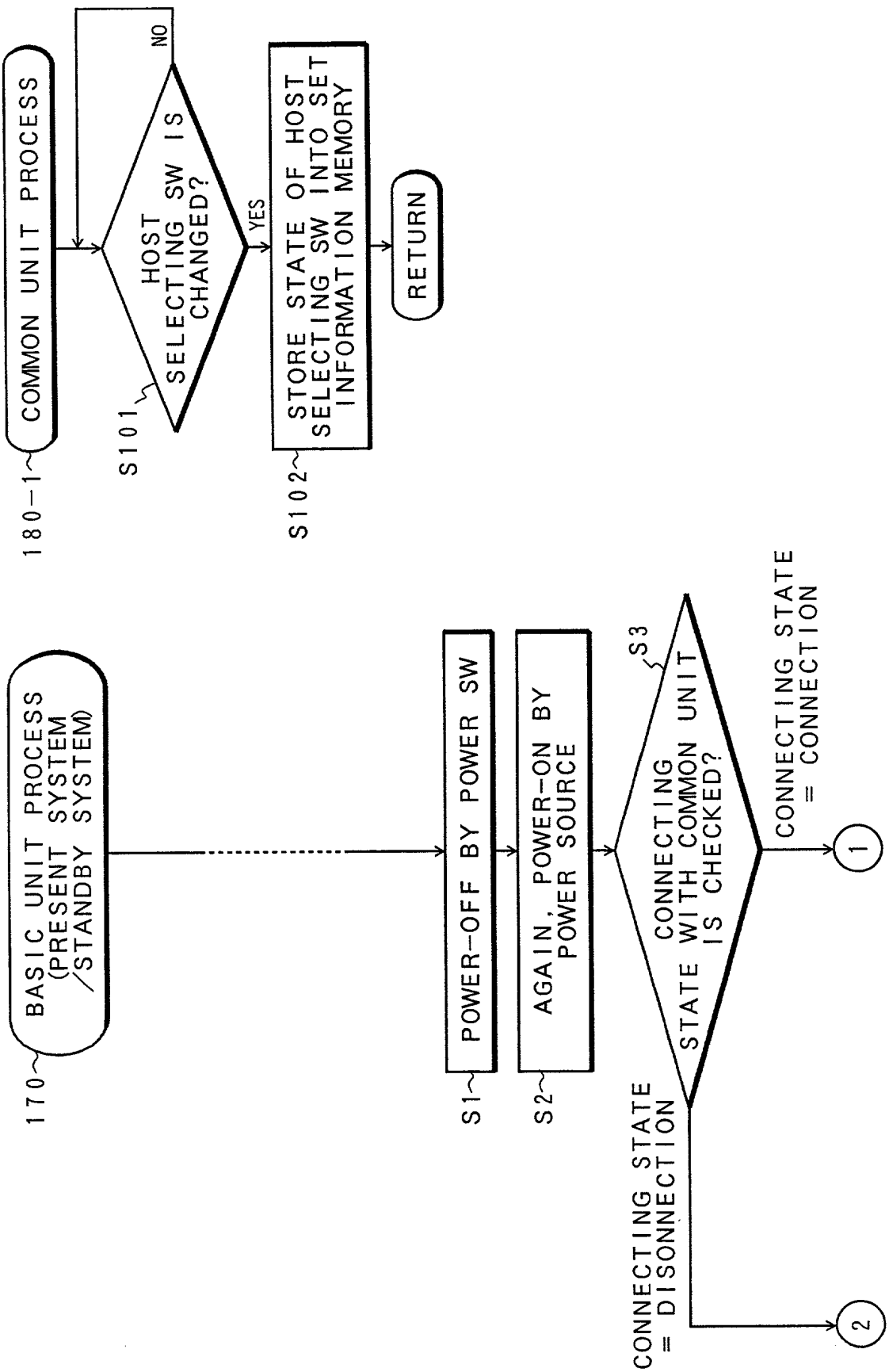
170
BASIC UNIT PROCESS (PRESENT SYSTEM /STANDBY SYSTEM)
S1
POWER-OFF BY POWER SW
S2
AGAIN, POWER-ON BY POWER SOURCE
S3
CONNECTING STATE WITH COMMON UNIT IS CHECKED?
CONNECTING STATE = DISCONNECTION
CONNECTING STATE = CONNECTION
2
1
180-1
COMMON UNIT PROCESS
S101
HOST SELECTING SW IS CHANGED?
NO
YES
S102
STORE STATE OF HOST SELECTING SW INTO SET INFORMATION MEMORY
RETURN

FIG. 11B

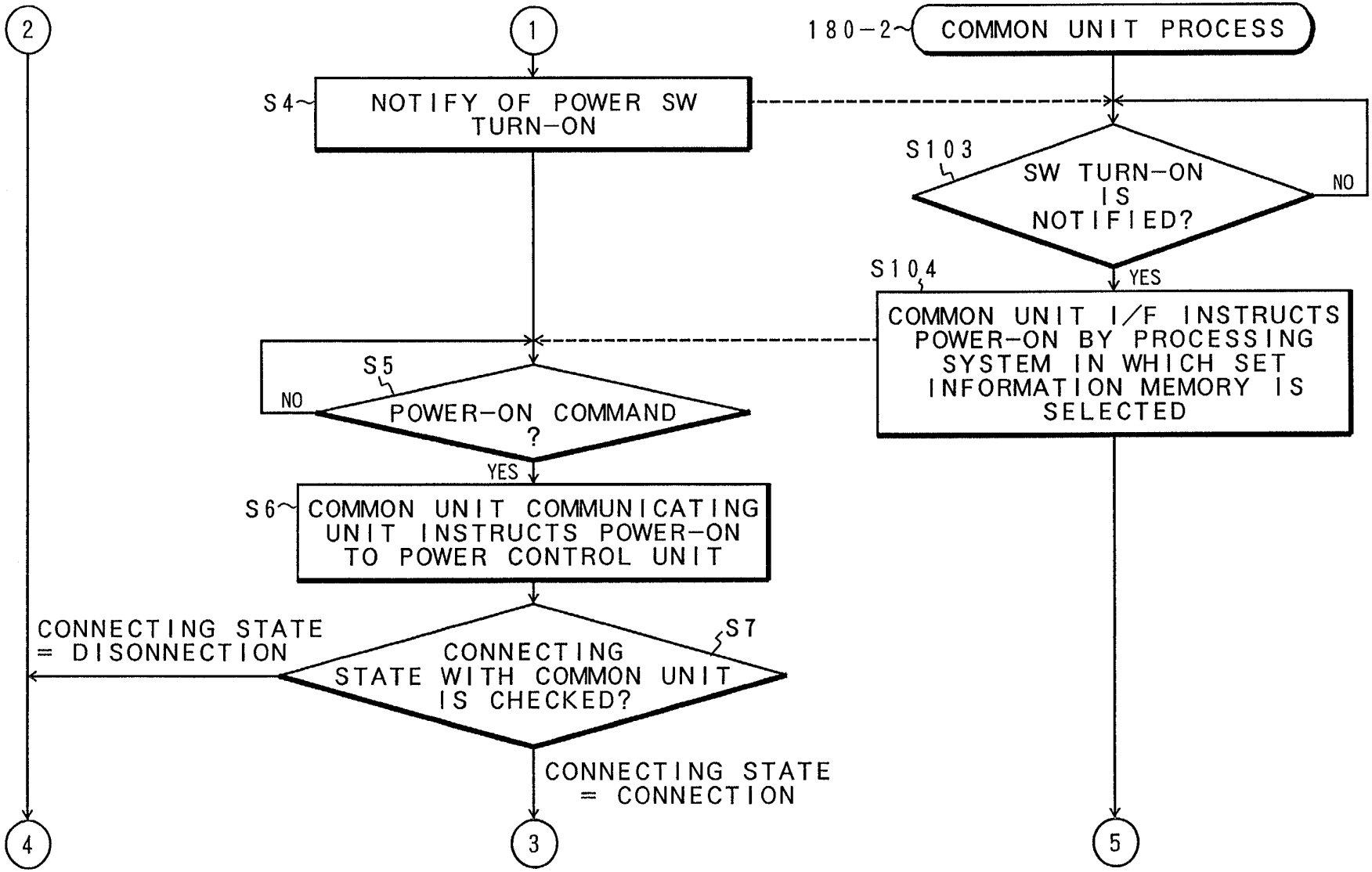
2
1
180-2
COMMON UNIT PROCESS
S4
NOTIFY OF POWER SW TURN-ON
S103
SW TURN-ON IS NOTIFIED?
NO
YES
S104
COMMON UNIT I/F INSTRUCTS POWER-ON BY PROCESSING SYSTEM IN WHICH SET INFORMATION MEMORY IS SELECTED
S5
NO
POWER-ON COMMAND ?
YES
S6
COMMON UNIT COMMUNICATING UNIT INSTRUCTS POWER-ON TO POWER CONTROL UNIT
S7
CONNECTING STATE WITH COMMON UNIT IS CHECKED?
CONNECTING STATE = DISONNECTION
CONNECTING STATE = CONNECTION
4
3
5

FIG.11C

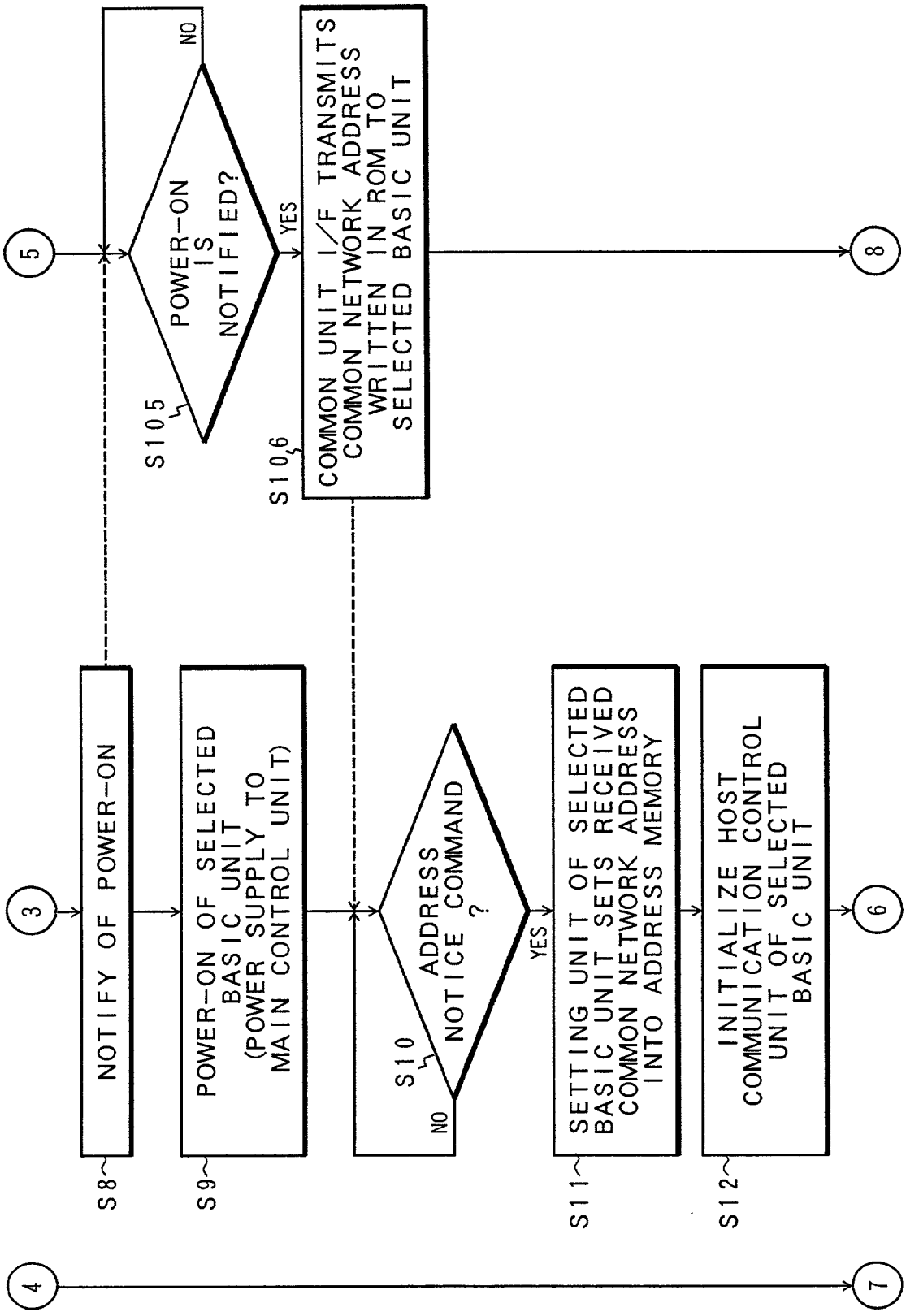
3
NOTIFY OF POWER-ON
S8
POWER-ON OF SELECTED BASIC UNIT (POWER SUPPLY TO MAIN CONTROL UNIT)
S9
S10
ADDRESS NOTICE COMMAND ?
NO
YES
SETTING UNIT OF SELECTED BASIC UNIT SETS RECEIVED COMMON NETWORK ADDRESS INTO ADDRESS MEMORY
S11
INITIALIZE HOST COMMUNICATION CONTROL UNIT OF SELECTED BASIC UNIT
S12
6
4
7
5
S105
POWER-ON IS NOTIFIED?
NO
YES
S106
COMMON UNIT I/F TRANSMITS COMMON NETWORK ADDRESS WRITTEN IN ROM TO SELECTED BASIC UNIT
8

FIG. 11D

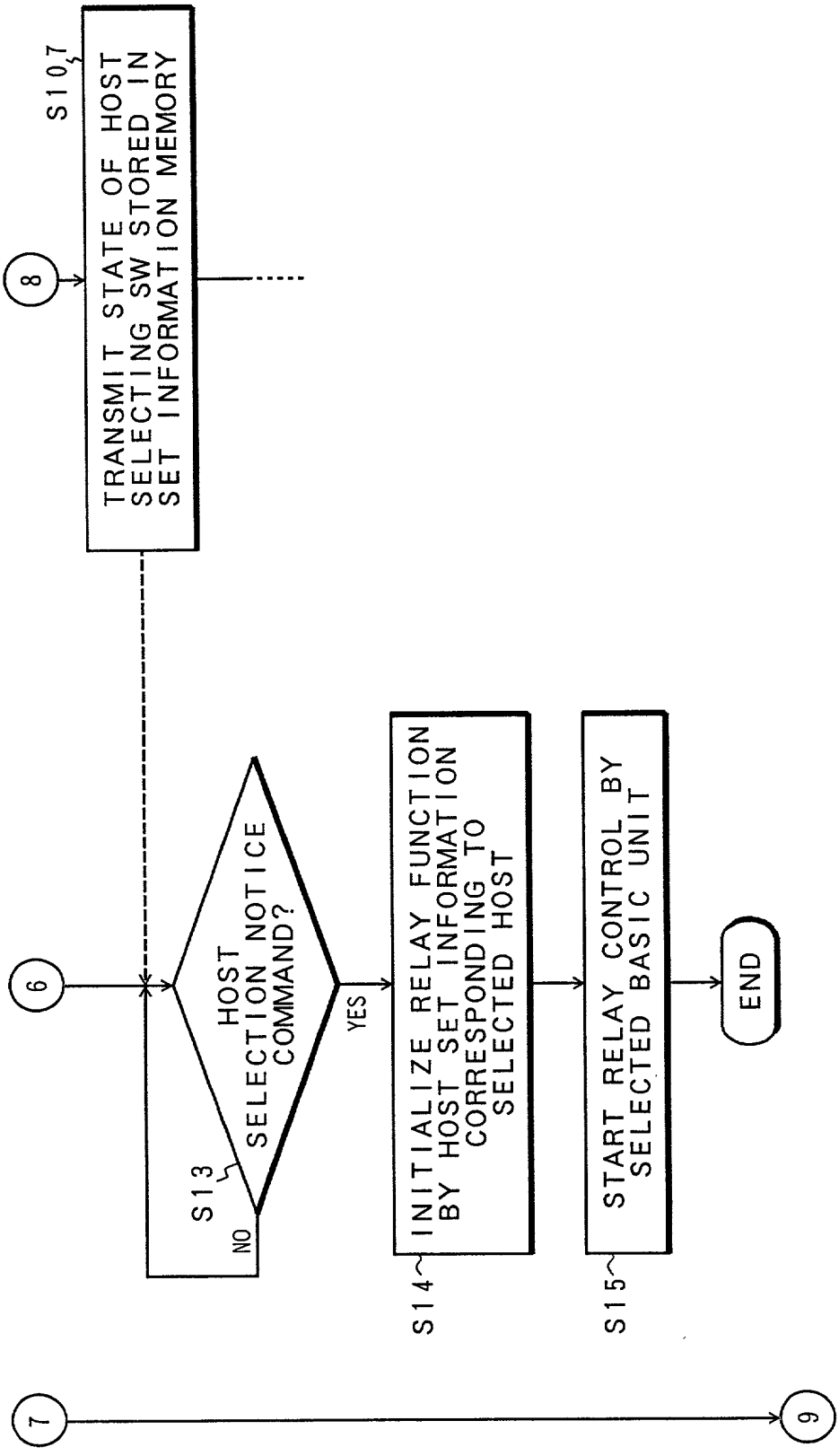
8
S107
TRANSMIT STATE OF HOST SELECTING SW STORED IN SET INFORMATION MEMORY
6
S13
HOST SELECTION NOTICE COMMAND?
NO
YES
S14
INITIALIZE RELAY FUNCTION BY HOST SET INFORMATION CORRESPONDING TO SELECTED HOST
S15
START RELAY CONTROL BY SELECTED BASIC UNIT
END
7
9

FIG. 11E

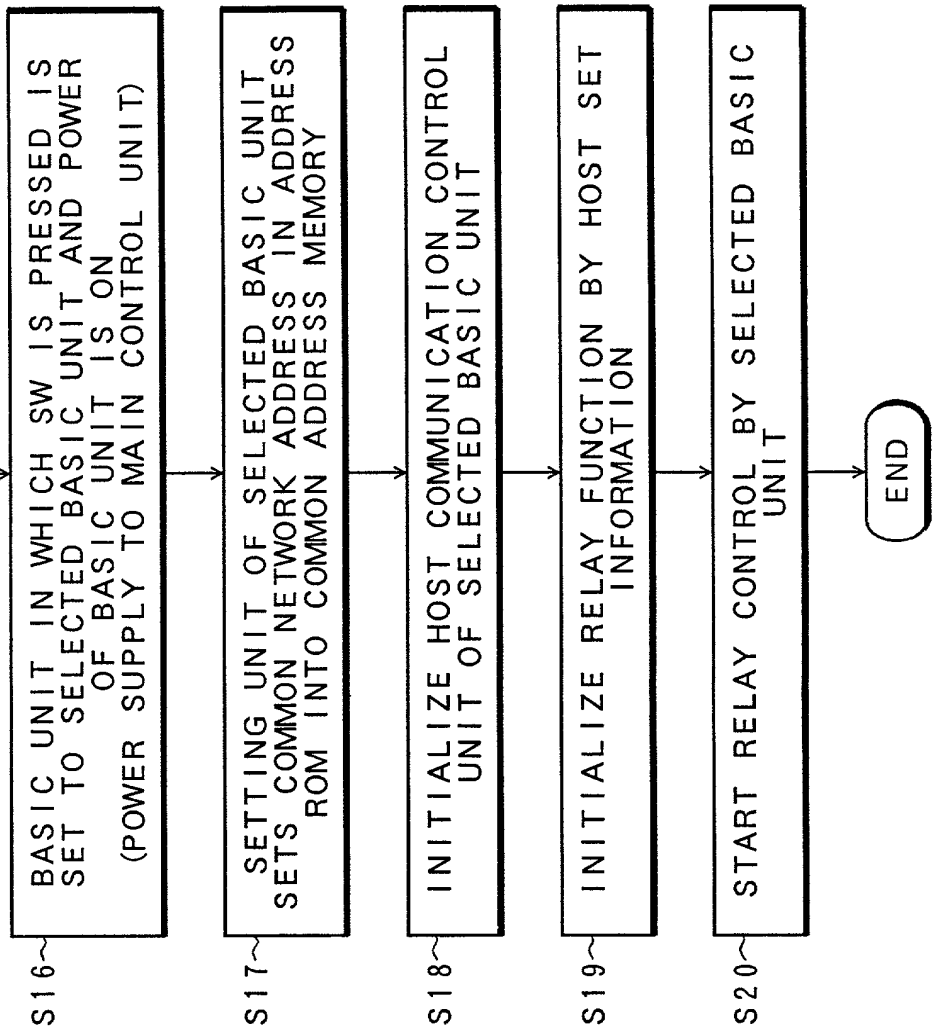
9
S16
BASIC UNIT IN WHICH SW IS PRESSED IS SET TO SELECTED BASIC UNIT AND POWER OF BASIC UNIT IS ON (POWER SUPPLY TO MAIN CONTROL UNIT)
S17
SETTING UNIT OF SELECTED BASIC UNIT SETS COMMON NETWORK ADDRESS IN ADDRESS ROM INTO COMMON ADDRESS MEMORY
S18
INITIALIZE HOST COMMUNICATION CONTROL UNIT OF SELECTED BASIC UNIT
S19
INITIALIZE RELAY FUNCTION BY HOST SET INFORMATION
S20
START RELAY CONTROL BY SELECTED BASIC UNIT
END

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FIG. 12A

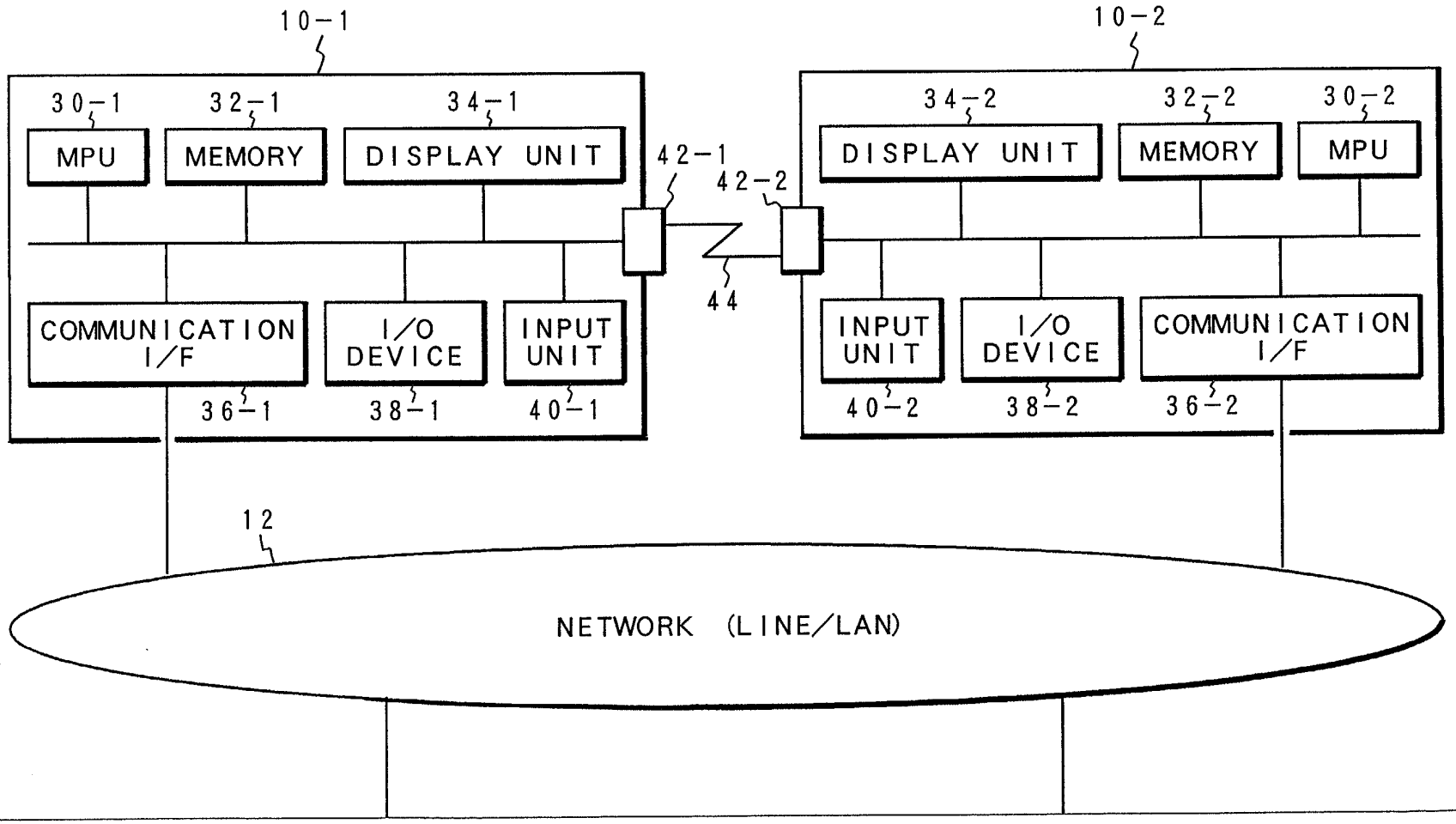


FIG. 12B

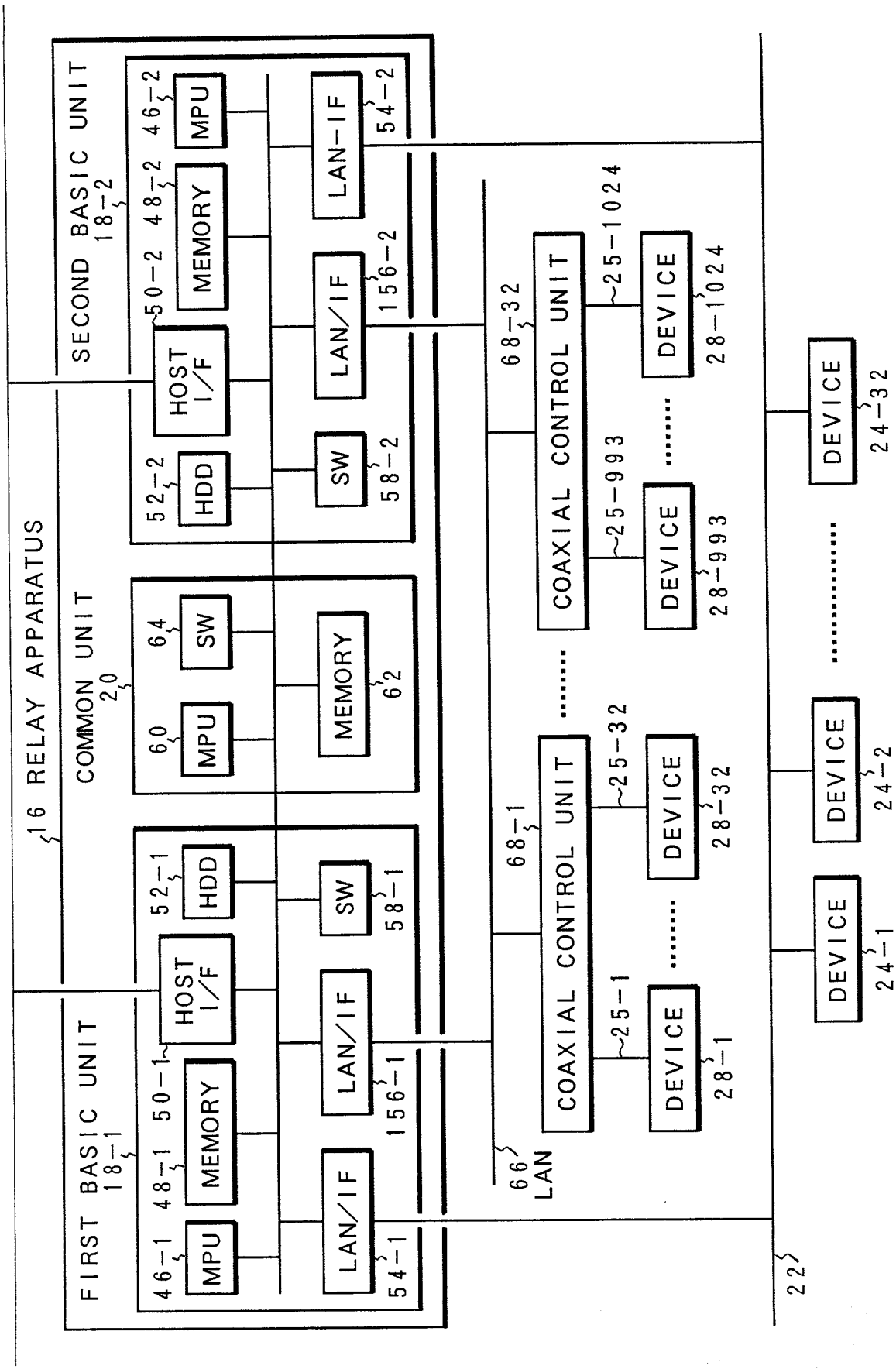

16 RELAY APPARATUS
FIRST BASIC UNIT 18-1
SECOND BASIC UNIT 18-2
COMMON UNIT 20
MPU 46-1
MEMORY 48-1
50-1
HOST I/F
HDD 52-1
SW 58-1
LAN/IF 54-1
156-1
60
MPU
64
SW
MEMORY 62
52-2
HDD
HOST I/F 50-2
MEMORY 48-2
MPU 46-2
SW 58-2
LAN/IF 156-2
LAN-IF 54-2
66 LAN
68-1
COAXIAL CONTROL UNIT
25-1
25-32
DEVICE 28-1
DEVICE 28-32
68-32
COAXIAL CONTROL UNIT
25-993
25-1024
DEVICE 28-993
DEVICE 28-1024
22
DEVICE 24-1
DEVICE 24-2
DEVICE 24-32

FIG.13A

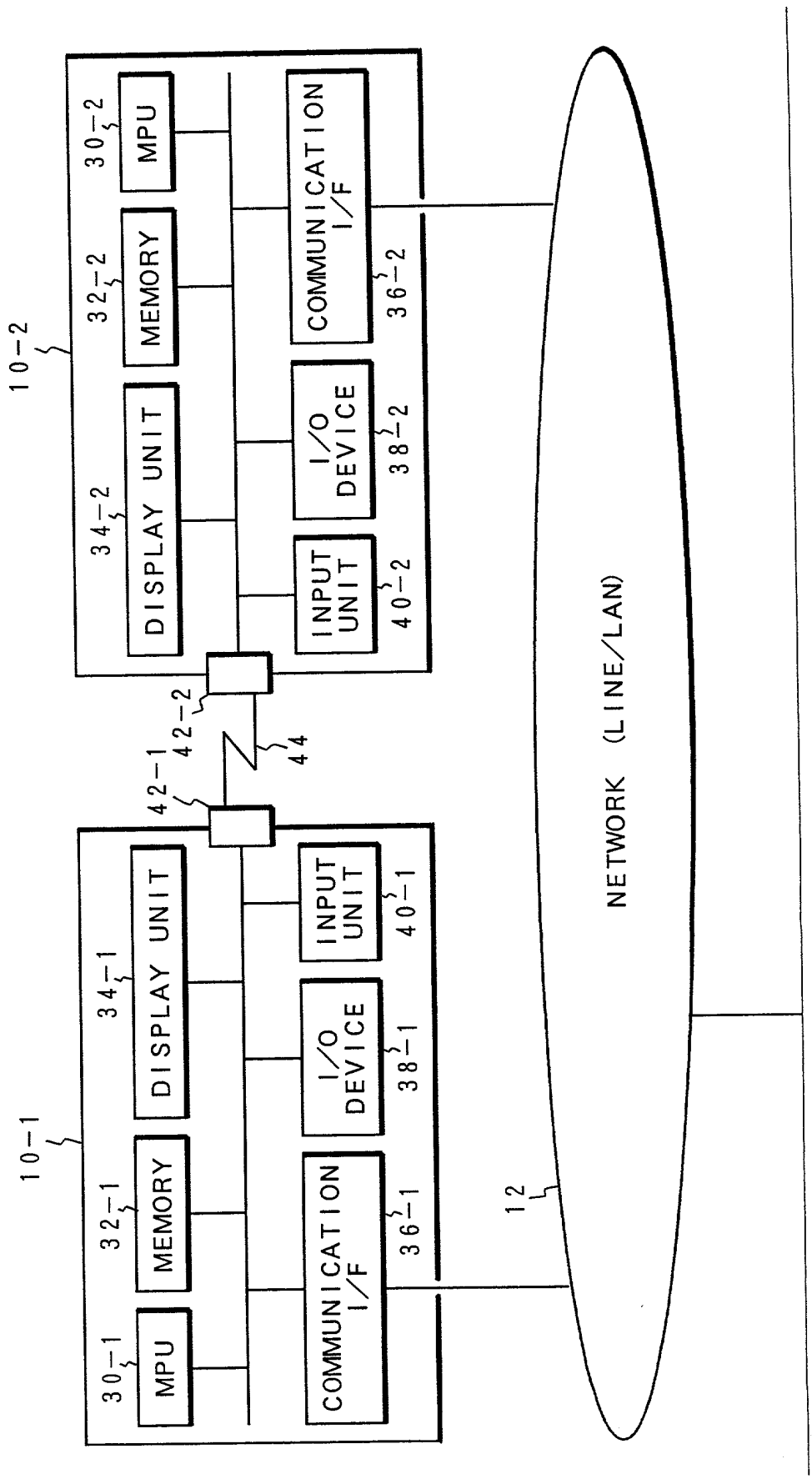

10-1
30-1
MPU
32-1
MEMORY
34-1
DISPLAY UNIT
INPUT UNIT
40-1
I/O DEVICE
38-1
COMMUNICATION I/F
36-1
42-1
42-2
44
10-2
30-2
MPU
32-2
MEMORY
34-2
DISPLAY UNIT
INPUT UNIT
40-2
I/O DEVICE
38-2
COMMUNICATION I/F
36-2
12
NETWORK (LINE/LAN)

FIG. 13B

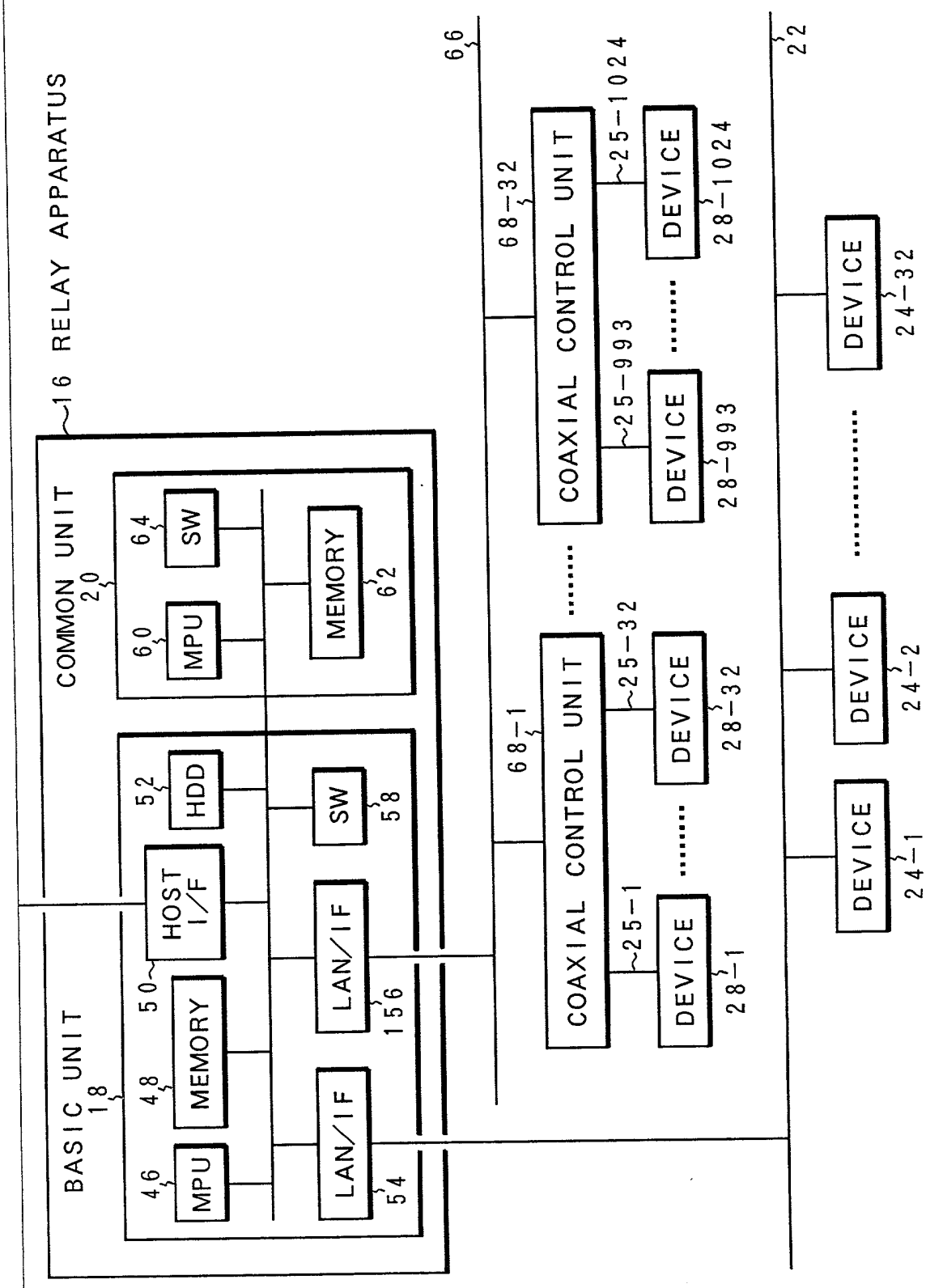

16 RELAY APPARATUS
BASIC UNIT
18
MPU
46
MEMORY
48
HOST I/F
50
HDD
52
LAN/IF
54
LAN/IF
156
SW
58
COMMON UNIT
20
MPU
60
SW
64
MEMORY
62
66
68-1
68-32
COAXIAL CONTROL UNIT
25-1
25-32
25-993
25-1024
DEVICE
28-1
28-32
28-993
28-1024
22
DEVICE
24-1
24-2
24-32

FIG. 14A

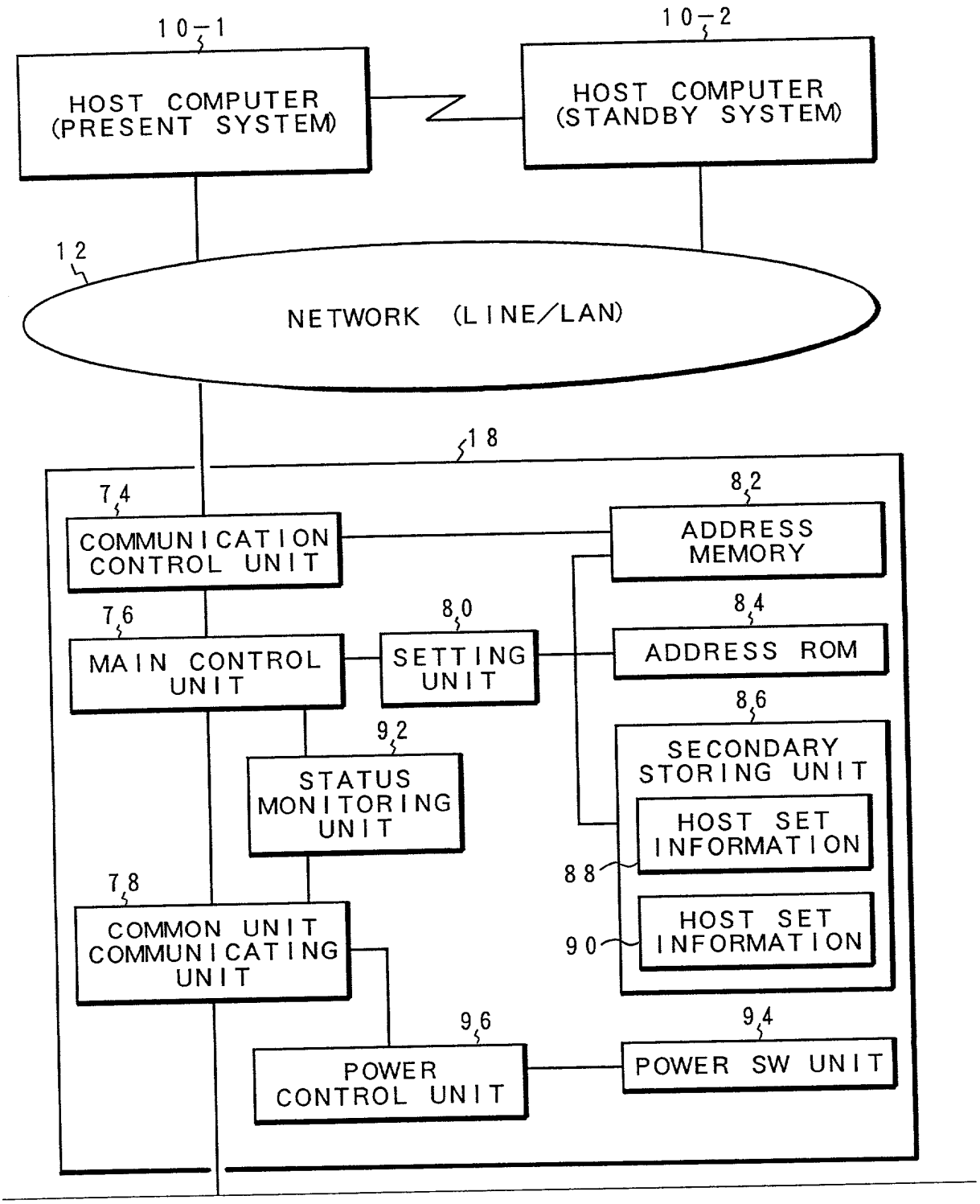
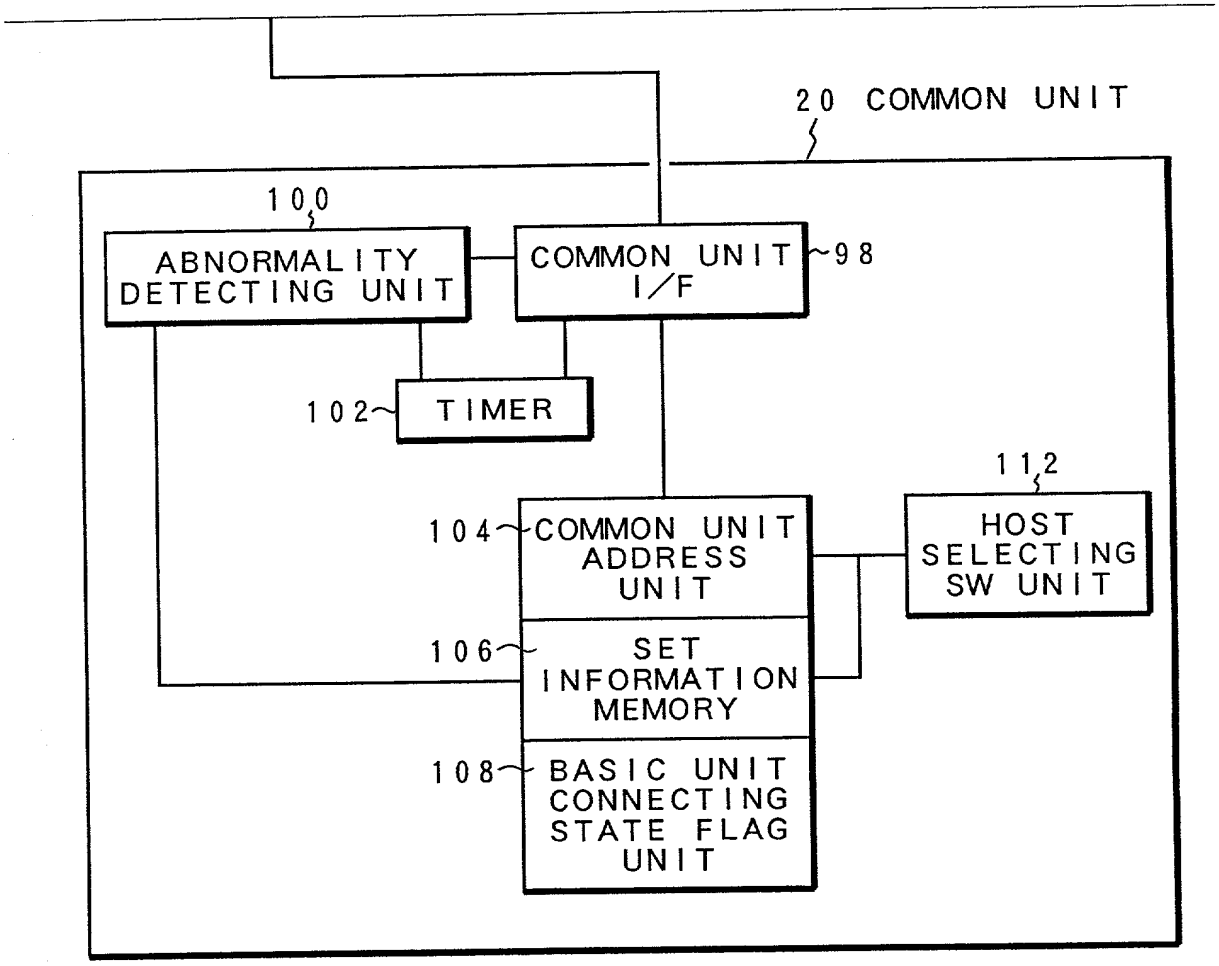

10-1
HOST COMPUTER (PRESENT SYSTEM)
10-2
HOST COMPUTER (STANDBY SYSTEM)
12
NETWORK (LINE/LAN)
18
74
COMMUNICATION CONTROL UNIT
82
ADDRESS MEMORY
76
MAIN CONTROL UNIT
80
SETTING UNIT
84
ADDRESS ROM
86
SECONDARY STORING UNIT
92
STATUS MONITORING UNIT
88
HOST SET INFORMATION
90
HOST SET INFORMATION
78
COMMON UNIT COMMUNICATING UNIT
96
POWER CONTROL UNIT
94
POWER SW UNIT

FIG. 14B


20 COMMON UNIT
100
ABNORMALITY DETECTING UNIT
COMMON UNIT I/F
98
102
TIMER
112
104
COMMON UNIT ADDRESS UNIT
HOST SELECTING SW UNIT
106
SET INFORMATION MEMORY
108
BASIC UNIT CONNECTING STATE FLAG UNIT